THE

Volume Fifty-Three

Journal

OF THE

AMERICAN OSTEOPATHIC ASSOCIATION

NEUROPSYCHIATRY NUMBER

Number 3 | 212 East Ohio St., Chicago 11, Ill. | November, 1953

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By the Staff of the Institute for Sex Research, Indiana University. ALFRED C. KINSEY, WARDELL B. POMEROY, CLYDE E. MARTIN, PAUL H. GEBHARD, Research Associates. 842 pages, 6" x 9". 151 charts; 179 tables; 4 illustrations. $8.00. *New*

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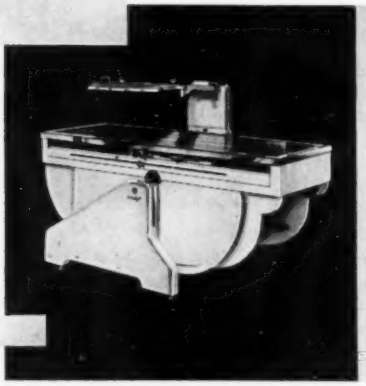

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Published monthly by the American Osteopathic Association. Office of Publication, 100 S. Kenilworth Ave., Oak Park, Ill. Address all communications to the Main Office at 212 E. Ohio St., Chicago, 11, Ill. Subscriptions $10 a year. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized August 31, 1922. Entered at the Oak Park, Ill., post office as second class matter, April 1, 1926, under the Act of March 3, 1879.

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5. Hamilton, H., in Trans. 5th Am. Cong. Obst. & Gyn., Mosby, 1952, p. 69.

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1. The Physiological Basis of Medical Practice. 1945, p. 486.
2. New England J. Med. 235:80, July 18, 1946.

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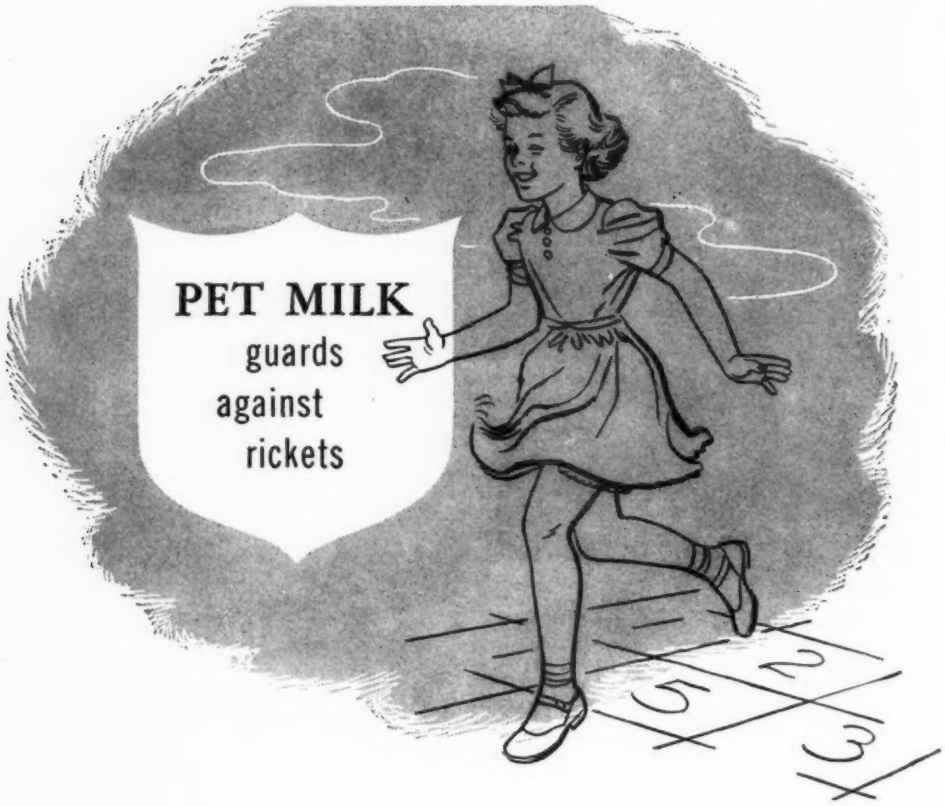

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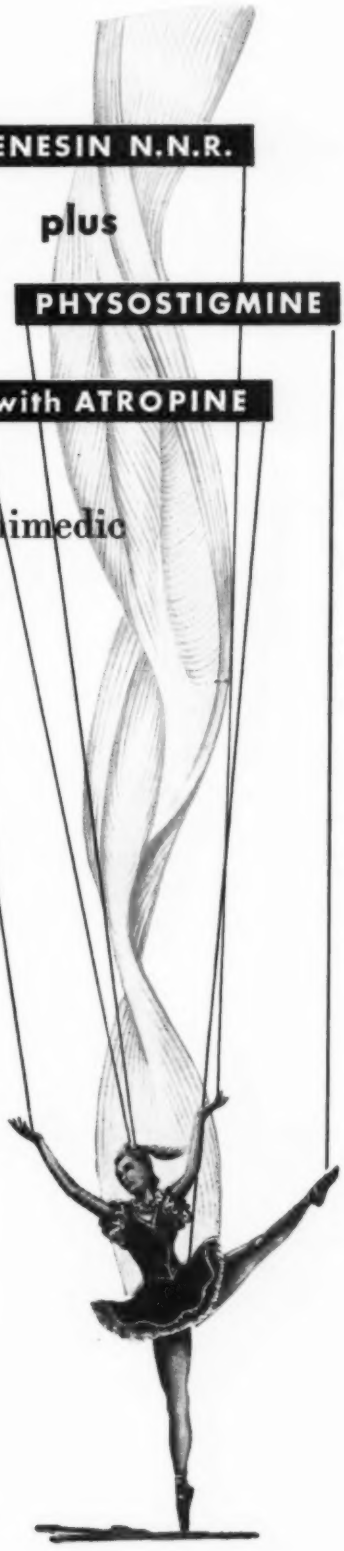

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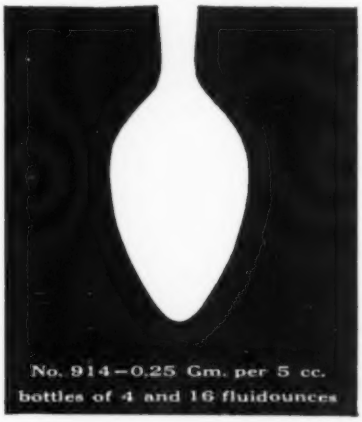

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*Shaw, H.N.; Henriksen, E.; Kessel, J.F.; and Thompson, C.F.: Clinical and Laboratory Evaluation of "Vagisol" in the Treatment of Trichomonas Vaginalis Vaginitis, Western J. of Surg., Obst. & Gynec. 60:563 (Nov.) 1952.

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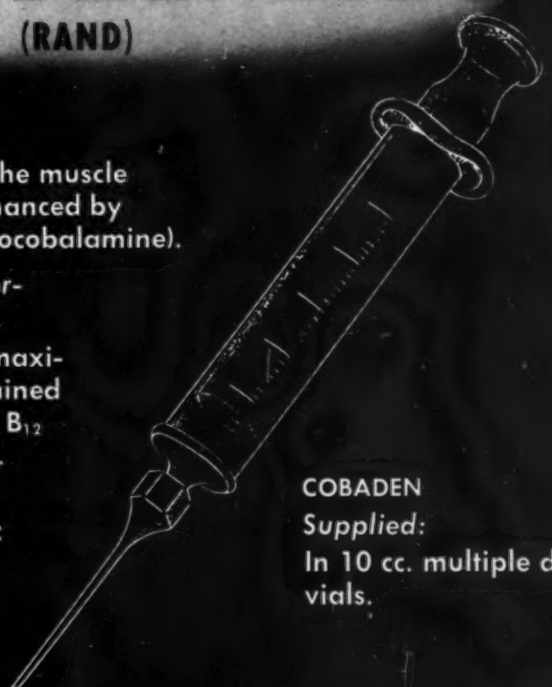

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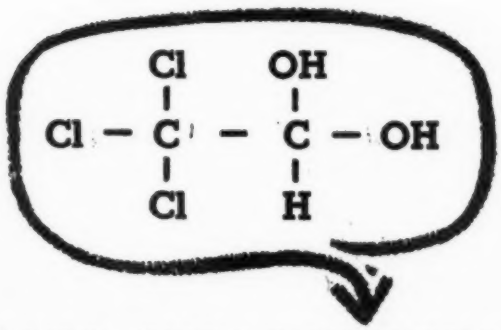

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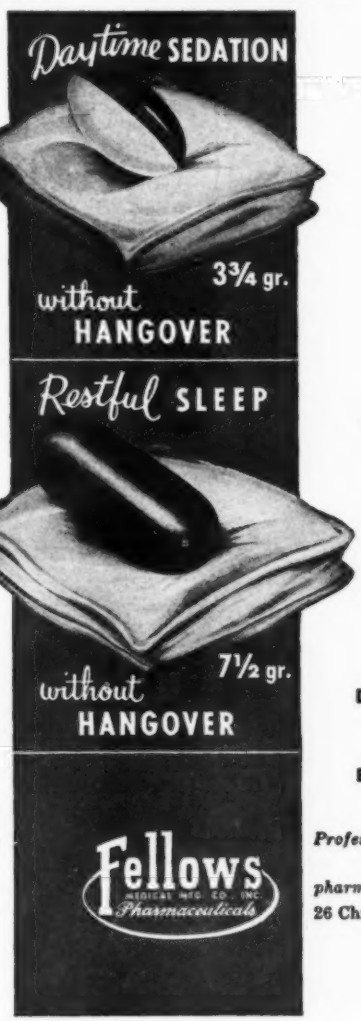

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2. Rehfuss, M. E. et al: A Course in Practical Therapeutics (1948).
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4. Sollmann, T.: A Manual of Pharmacology, 7th ed. (1948), and Useful Drugs, 14th ed. (1947).

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1. Sebrell, W. H., Jr.: Trends and Needs in Nutrition, J.A.M.A. *152*:42 (May 2) 1953.
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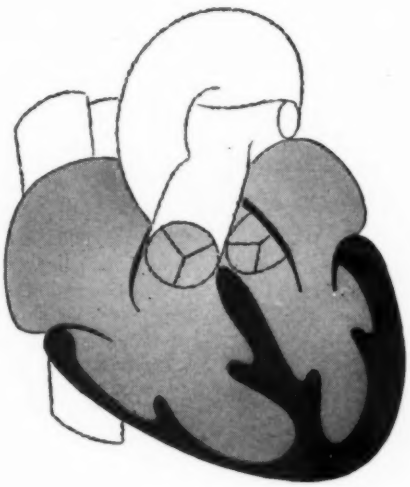

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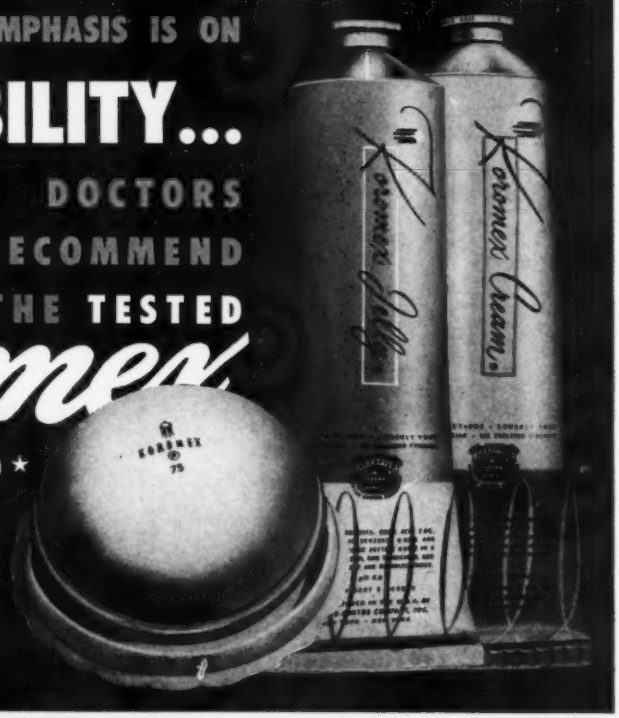

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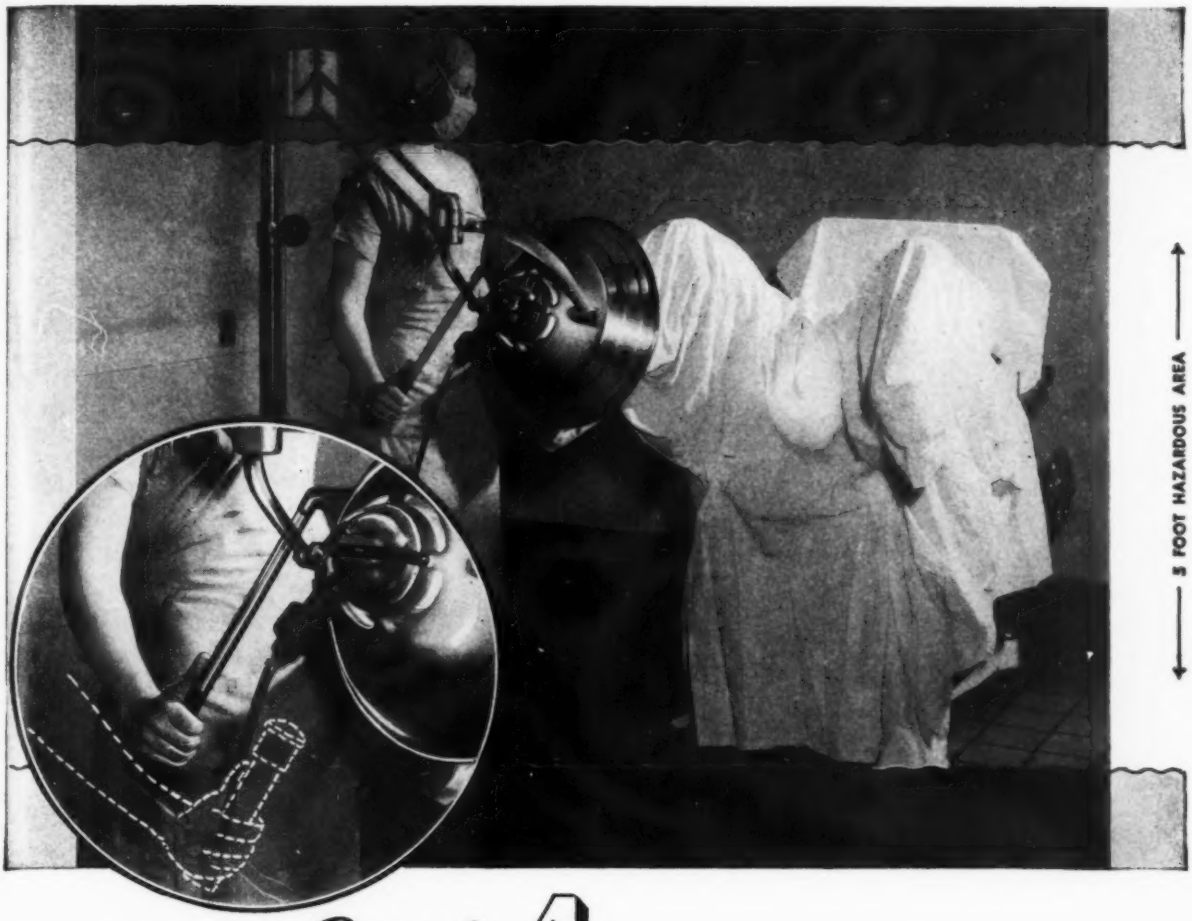

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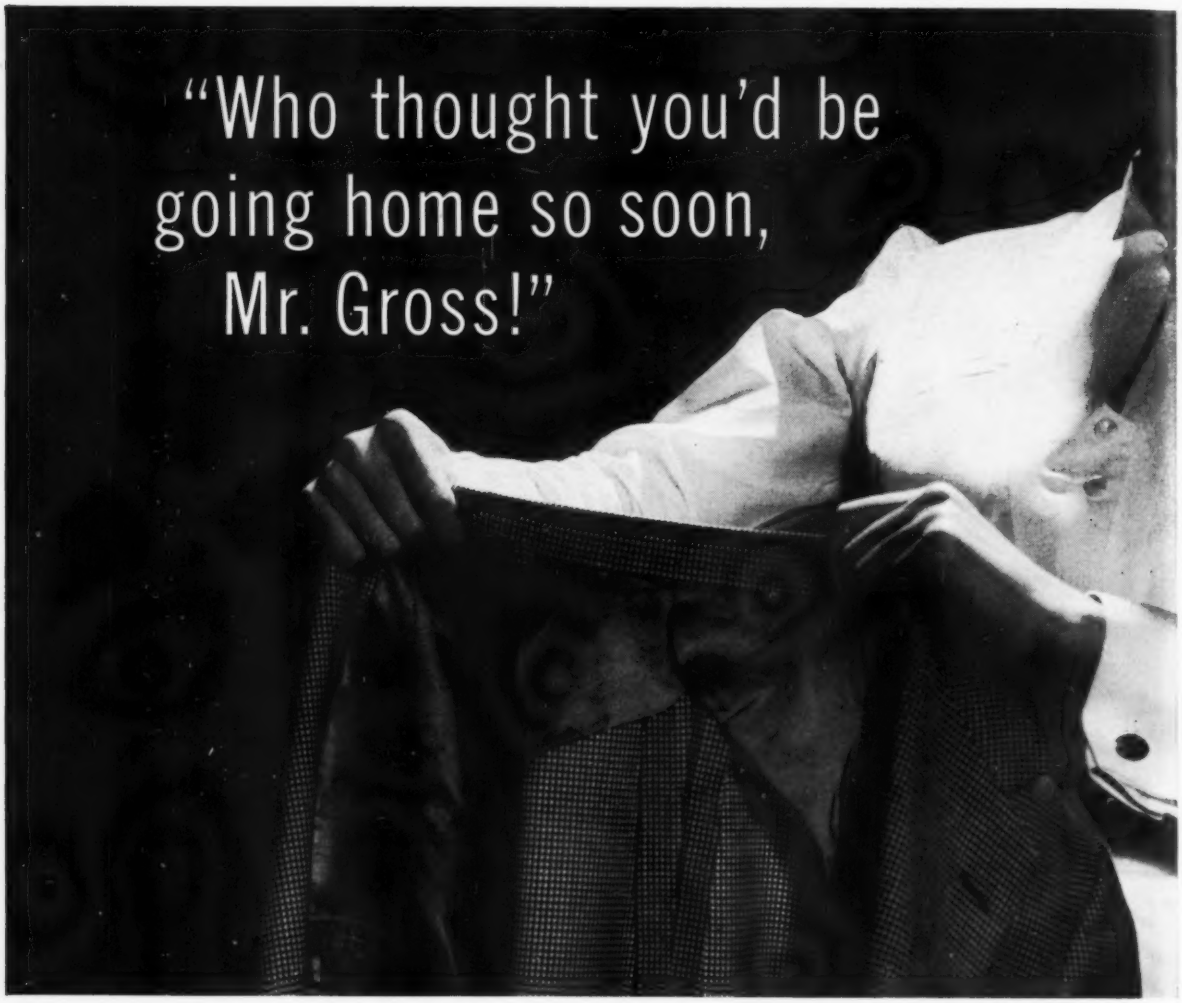

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PUBLISHED MONTHLY BY THE AMERICAN OSTEOPATHIC ASSOCIATION

Vol. 53, No. 3 | 212 East Ohio St., Chicago 11, Ill. | November, 1953

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Motion Sense*

MYRON C. BEAL, D.O.
Rochester, N. Y.

INTRODUCTION

The diagnosis of an articular lesion is based upon changes in tissue tension and consistency, changes in joint position, and changes in the mobility of the joint. The importance of each of these factors must be evaluated at the time of examination. One factor may carry more weight than another in the establishment of the diagnosis, but osteopathic manipulative technic is based primarily upon the alteration of joint mobility. The effect of treatment is judged by reviewing the diagnostic triad—tissue, position, and motion change. In some persons an alteration in joint mobility may be the only detectable change observed after treatment. Thus, it is apparent that a sense of joint motion is essential in the diagnosis, treatment, and prognosis of an articular lesion.

Motion is most commonly thought of in terms of visual experience, but an individual's body movements are observed more by his kinesthetic sense than by his visual sense. The kinesthetic sense is an important element in the palpatory examination of joint movement. Motion sense or the appreciation of movement is a subjective experience resulting from sensory impulses arising from proprioceptors and touch receptors. An adequate tactile stimulus may be provided by a wisp of cotton or a fine hair which deforms the skin surface. Pressure like that of a pencil point will stimulate the deeper proprioceptors lying in the dermis. Joint movement, resistance, shock or impact, and lack of mobility are appreciated by the deeper receptors of the proprioceptive system. These receptors, the pacinian corpuscles, are found in the dermis, muscle, tendons, periosteum, and other deep-seated structures. Thus motion sense is derived both from light touch sensation and the deeper proprioceptors.

The study of motion is just one step in the development of the sense of touch. Stinson and Allen[1,2] have described the basic steps in the acquisition of tactile perception. Their articles are osteopathic classics and are worthy of repeated perusal.

The study of joint motion requires a moving articulation, preferably one which can be moved passively, and a receptor. The pads of the fingers provide the most sensitive areas for touch perception, and these act as the receptors. The thickness of the skin surface will determine to a certain degree the sensitivity of the receptor apparatus.

Since the proprioceptive system is essential for the perception of motion, it is important that the physician be relaxed at all times. All unnecessary proprioceptive stimuli should be reduced to a minimum in order not to detract from the palpatory sense. Contracted muscles send proprioceptive impulses to the central nervous system which may produce interference with the perception of the impulses from the motion test.

Repeated practice of the technics of motion testing is necessary to develop such a degree of facilitation that the physician's attention is directed to the sensitive palpating fingers rather than to the mechanics of the motion test. A concerted effort should be made to concentrate on the impulses received from the fingers since a momentary lapse in concentration may distort the sensory impression or render it invalid. Unfortunately the physician is not always cognizant of the fact that this has occurred.

In testing for joint motion one hand generally introduces movement into the articulation while the other acts as the receiver. An exception to this is found in the spring test for rotation of the lumbar spine where one hand alone may act as pressor and receptor. Here one thumb is placed over the transverse process of a vertebra and downward pressure is applied in a springing manner. This type of test represents one of the grosser tests of motion, and one which the student should be able to learn early. However, pressure is more commonly applied through one thumb superimposed upon the other. The lower of the two acts as the receiver, being relaxed; the top acts as the pressor. With this test the beginner finds it difficult to receive impressions through only one thumb, that is, to disassociate pressure application from pressure reception. The test may be conceived as human radar. One thumb sends out impulses and the other receives them.

In this test the resistance to pressure is observed first over one transverse process and then over the other. The two impressions are compared. In the beginning the student finds it difficult to relax the

*Presented at the annual meeting of the Montana Osteopathic Association, Great Falls, July 6-8, 1953.

lower hand and to apply the right amount of pressure with the upper hand. The latter is accomplished by slowly applying pressure down through the soft tissues, until contact is made with the transverse process; then a slight springing downward force is applied. This springing force may have to be repeated several times before ascertaining the amount necessary to perceive the degree of motion present. The reaction to this test is variable: (1) A resiliency, a springing sensation, a freedom of movement with a swing and a return can be felt (Fig. 1); (2) a quality of resistance requiring more pressure to elicit movement and a slight sluggishness to the swing which may be caused by muscular contracture; (3) a resistance to movement and no rebound but a gradual return; (4) no motion at all, a hard resistance to pressure.

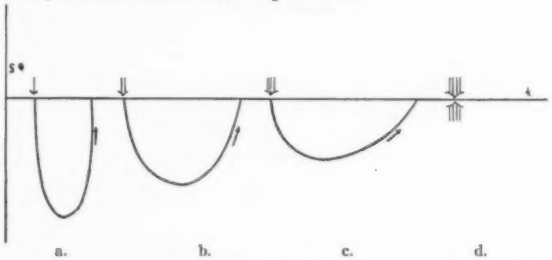

Fig. 1. The spring test for rotation of the lumbar spine. The size of the arrows indicates the relative amount of pressure applied.

a. Springiness or resiliency
b. Elasticity or pliability
c. Resistance
d. Rigidity or pressure
s. Sensory impression
d. Time impression

This pressure spring motion test may be developed along with the ability to perform deep palpation. The important feature of this test is the initial palpation down to the bone followed by the further application of sufficient force to detect the nature of the movement, denoted as springiness or resiliency, plasticity or pliability, resistance, and rigidity or pressure. The springing type of method may be used with one hand over the joint while the other applies force to one member of the articulation. The sacroiliac joint may be tested for motion in this manner.

The usual test of motion involves the palpation of the junction of two articular surfaces by the finger or fingers of one hand while passive movement is introduced into the joint by the other hand. Motion is most easily perceived in the extremities where palpation can be directed to the surface of the joint without too much interference by excessive intervening tissue. In the spine it is often difficult to palpate directly over a facet, consequently technics are employed which test reflected motion at a distance from the articulation. These tests are not as reliable as those in the extremities since the accuracy of the test is in direct proportion to the distance between the joint and the receptor. Therefore, the beginner is usually referred to a joint in the extremities to commence his study of joint movement.

PHYSIOLOGIC MOTION

One of the best joints for the beginner to practice on is the distal phalanx of a finger. It is difficult to practice with one's own finger, but it can be done if a substitute is not available. The first thing to learn to appreciate is the feeling which may be figuratively described as a "wave of motion," the sensation of a ripple of movement which comes to rest under the palpating finger, somewhat in the manner of the air bubble in a water level, and then passes from under the palpating finger as the distal phalanx is flexed and extended. The next thing to perceive is the direction of this wave of motion. How does it correspond to flexion and extension? When this is perceived, the advance of this wave of motion may be controlled; that is, recognition leads to the ability to control the degree of movement so that the point of movement seems to be appreciated or sensed at all times. With this latter recognition the limits of joint movement may be detected. The total range of a particular movement may be explored.

The limit or extreme of joint motion is perceived as a finite point. When it is reached the wave of motion appears to rise or fall over a barrier and pass on into the next articulation (Fig. 2).

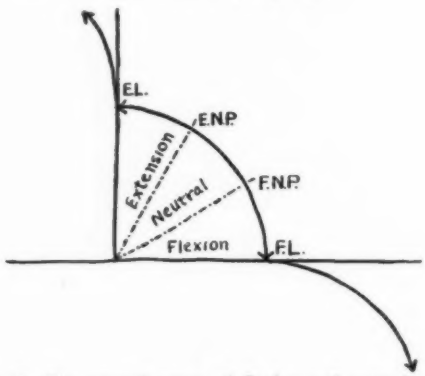

Fig. 2. The normal range of flexion and extension movement.

E.L. Extension Limit
E.N.P. Extension Neutral Point
F.N.P. Flexion Neutral Point
F.L. Flexion Limit

The ability to detect movement and to delineate the limits of motion of a joint in the flexion and extension axis is one of the first steps in the development of motion sense. Physiologic motion must be studied prior to developing the ability to determine pathologic motion or alterations in joint mobility.

A point to be noted in the study of physiologic motion is that there appears to be a neutral point, like the neutral point in a gear shift, within the range of flexion and extension. In fact two separate neutral points are found in that portion of the range of movement adjacent to the place where the joint tissues begin to tighten up as further flexion or extension is introduced. These neutral points may be difficult to perceive. They may appear to coincide or to be adjacent to one another.

The normal physiologic range of flexion-extension movement may be described as follows: flexion limit, flexion neutral point, neutral, extension neutral point, and extension limit (Fig. 2). These neutral points are especially important. Their recognition is utilized in motion tests and all osteopathic corrective technics. Correction should always commence at a neutral point within the range of the joint movement.

When the distal phalanx is tested for motion, the wave of motion is detected first. This wave is brought under the palpating finger and localized in the neutral

area. Next the limits of the range of movement are sought and explored. A slow steady movement is used. Too rapid movement will give too many impulses to the receptors of the palpating fingers. If the movement is lost, the distal phalanx should be returned to the neutral area and a new start made. The pads of the palpating fingers are used and the hand should be relaxed at all times to avoid stimulation of any extraneous impulses of a proprioceptive nature, which might interfere with the interpretation of motion changes. Too many trials in testing motion should also be avoided, since pathologic joint motion may be changed by the motion test. In essence this is an articulatory movement and in some cases it is corrective in nature. One of the difficulties encountered in attempting to demonstrate motion changes to students results from the fact that the original findings may be changed after examination by one or more observers.

If properly learned, the test of motion will greatly assist the development of corrective articulatory technic. Articulation may differ only in the use of a slightly firmer force throughout the total range of the joint or in one special phase of its movement.

PATHOLOGIC MOTION

The articular lesion is seldom something "out of place"—an implication of gross change. It is more often a locking or wedging of a joint. A good example of the usual lesion phenomenon is illustrated by opening a window. If it is pushed up on one side only, it jams or wedges so that it cannot be moved further and sometimes it can be moved down again only with difficulty.

However, it is apparent that there are many types of joint restriction. To use the flexion-extension range of movement of the spine as an illustration, an articular lesion may disclose:

1. Greater freedom or greater range of movement than normal. Usually this condition is present after a recent injury. The laxity or looseness of movement as well as the total range of movement may be increased.

2. Disturbance in the total range of movement, a limitation or disturbance in quality.

3. Limitation in the extremes of movement.

4. Disturbance in the quality of movement without disturbance in range. This may occur in the total range of movement, or in one extremity, or in some phase of the range of movement. Early arthritic change may give this impression. Changes in quality are usually associated with a limitation in the range of movement, but sometimes they may be found subtly alone.

5. Total shift of the range of movement, a compensatory increase.

6. No detectable movement.

Restrictions in joint movement may be caused by trauma to the joint resulting in some mechanical disorder. They may also be caused by a disturbance in the tissues surrounding the joint. Pain, disease of the joints, fractures, and neurologic diseases may all limit or change the movement in a joint.

Physiologic changes in joint motion may exist as a result of individual variations or development such as the anomalies of the lumbosacral facets. Furthermore, the body's elasticity varies with each individual. Aging results in a gradual loss of tissue and joint elasticity. Moreover, joint movement is found in proportion to the activity of the individual. Certain occupations demand and maintain greater joint motion than others. Individuals in sedentary occupations gradually lose a degree of their joint freedom through disuse. Body mobility may also be associated with body type. One classification of body types is based upon the range of flexion and extension of the wrist.

MOTION AND PROGNOSIS

There appears to be a direct relationship between disorders in joint motion and symptomatology. Because the restoration of joint movement is associated with a return of function and the relief of symptoms, it is used as a clinical guide in prognosis. However, there are certain problems in the use of motion as a guide to recovery. Sometimes the restoration of movement appears complete before the symptoms disappear. This may be explained by a retardation of the relationship of the other parts of the body to the reactivation of the injured joint. This symptomatic lag may be caused by a weakness of the tissues surrounding the joint or a delay in soft tissue recovery.

Unfortunately in some cases the symptoms persist in spite of complete restoration of joint motion. There must be some other causative or aggravating factor in these cases. Often posture, occupation, or habits will prevent complete symptomatic recovery. Patients in whom symptoms persist after return of joint motion present puzzling problems.

Occasionally the patient's symptoms disappear before the complete range of movement is restored. The explanation for this phenomenon may be that the patient's functional movement has been restored; his movement for ordinary tasks is adequate. However, if he were to attempt to use the complete range of his joint movement, he might again develop symptoms of joint dysfunction. It is sometimes difficult to convince such patients that they require more osteopathic manipulative treatment. They are apt to discontinue therapy and then return with a reaggravation of their symptoms.

Thus, it is evident that a sense of joint movement is necessary in the prognosis of an articular lesion as well as in its diagnosis and treatment. In fact motion sense constitutes the culmination of palpatory skill and is the limiting factor in the art of manipulation.

SUMMARY

An attempt has been made to describe the sensory impressions arising from testing joint motion. Physiologic and pathologic motion have been discussed as well as the relation of motion and prognosis.

17 Vick Park A

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Journal A.O.A.
November, 1953

Heredity in Spondylolisthesis and Spondylolysis

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Orthopedic literature shows that there is considerable interest in the etiology of spondylolisthesis and spondylolysis. During the past several years the opportunity of obtaining low-back x-ray studies on four generations in a single family was presented to me. In checking x-rays of several members of this family, persistence of defects in the pars interarticularis with and without spondylolisthesis was noted in several members, and, therefore, effort was made to obtain x-rays of the entire group.

Spondylolisthesis is defined as the forward slipping of a vertebral body in relation to the body below it, accompanied by an isthmus defect. Prespondylolisthesis or spondylolysis refers to those cases presenting the isthmus defect without the forward slipping.

A review of the literature shows only scattered reports of spondylolisthesis occurring in a parent and child. George[1] reported cases occurring in the daughter, father, and grandmother. With this and one other exception, there are only three families in American literature and four families in European literature reported, with only two generations being reported in each family. Friberg[2] reports a rather exhaustive survey of a family covering four generations. He examined 61 of a possible 65 individuals. In this instance, he found 15 cases of spondylolisthesis. One of these was in the first generation, 5 in the second generation, and 9 in the third generation. It is interesting to note that 7 of the 9 in the third generation were from a single family where both parents had the defect. These cases would indicate heredity as a definite etiologic factor in spondylolisthesis and spondylolysis. My report offers further evidence along this line as a contribution to the literature on the subject.

Rowe and Roche[3] are of the opinion that spondylolisthesis is an acquired lesion resulting from fractures of the isthmus during infancy. I do not believe this is borne out by my study and by Friberg's study. Harris[4] believes that the knowledge at hand does not justify the assumption that spondylolisthesis could result from a failure of fusion of normal ossification centers of the pars interarticularis. He and Bailey[5] believe that the defect is due to a failure of fusion of two abnormal centers of development in the neural arch. Bailey points out the following evidence as indicative of a hereditary background for these cases: The defects involve more than one segment; 5 to 25 per cent are unilateral; the frequency in various races is the same, being approximately 5 per cent; there are numerous cases reported in children in recent years; two ossification centers are possible. In various studies of spondylolisthesis it is pointed out that other anomalies of the isthmus may be present, and other anomalies of the same vertebral segment are frequent.

The first member of the family which I studied presented a frank case of spondylolisthesis. The second member showed definite prespondylolisthesis. In two additional members of the family there were definite anomalies in the lumbosacral area, chiefly in the nature of incomplete fusion of the posterior neural arch. A diagram is presented showing the relationship of the several persons included in this study. The study includes all members of the second, third, and fourth generations directly descended from the individual representing the first generation.

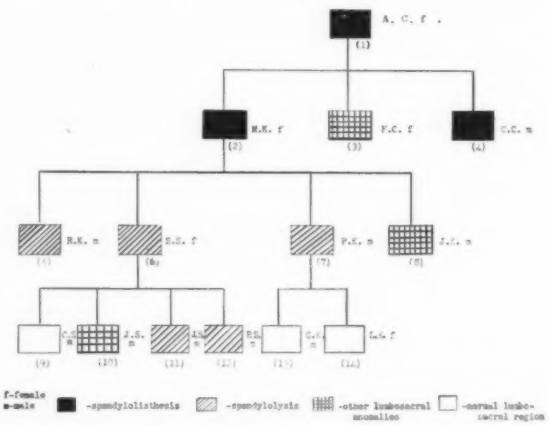

Diagram I. Familial incidence of spondylolisthesis and spondylolysis.

Case 1 (Figs. 1A and 1B). There are definite anomalies of the lumbosacral area with incomplete closure of the neural arch of the first sacral segment.

Fig. 1A

Fig. 1B

Fig. 2A

Fig. 2B

Fig. 3A

Fig. 3B

Fig. 4A

Fig. 4B

There are definite facet anomalies with sclerotic changes. There is definite thinning of the fourth and fifth lumbar interspaces with some erosion beginning in the fifth disk space. There is a slight spondylolisthesis with a pars interarticularis defect, the body of the fifth lumbar being forward approximately ⅛ inch.

Case 2 (Figs. 2A and 2B). There is a definite defect in the pars interarticularis and a frank spondylolisthesis. Facet anomalies are present with sclerotic changes.

Case 3 (Figs. 3A and 3B). There is incomplete closure of the neural arch of the first sacral segment with a facet anomaly and with thinning of the lumbosacral disk accompanied by minor arthritic changes.

Case 4 (Figs. 4A and 4B). There is frank second degree spondylolisthesis with the typical defect in the pars interarticularis. The lumbosacral facets are small and show some hypertrophic change.

Case 5 (Figs. 5A and 5B). There is incomplete fusion of the neural arch of the first sacral segment with a defect in the pars interarticularis of the fifth lumbar. There is a thinning of the lumbosacral disk with bilateral sclerotic changes in the lumbosacral arthrodiae.

Case 6 (Figs. 6A and 6B). There is a definite defect in the pars interarticularis bilaterally with facet anomalies. There is a slight thinning of the lumbosacral disk and an increased lumbosacral angle presenting a definite prespondylolisthesis.

Case 7 (Figs 7A and 7B). There is incomplete closure of the neural arch of the first sacral segment and a defect on one side of the pars interarticularis at the fifth lumbar. There are anomalous facets. There is again thinning of the fifth lumbar disk space and a prespondylolisthesis.

Case 8 (Figs. 8A and 8B). There is incomplete closure of the neural arch of the first sacral segment with facet anomalies at the lumbosacral level. There is some thinning of the lumbosacral disk.

All these patients of the first three generations show some postural abnormality but this is not constant as to the amount or the side of the short lower extremity.

Case 9. The lumbosacral region is normal.

Case 10. There is incomplete fusion of the neural arch of the first sacral segment.

Case 11. There is a questionable defect in the pars interarticularis. Sacralization of the fifth lumbar is present on the left. There is an incomplete fusion of the neural arch of the fifth lumbar and first sacral segments.

Case 12. There is a defect in the pars interarticularis. Extra centers of ossification are present in the first sacral segment.

Case 13. The lumbosacral region is normal.

Case 14. The lumbosacral region is normal.

X-rays of the last six cases are not shown since they were of children and did not reproduce adequately for publication.

SUMMARY

This study of four generations of a family presents an incidence of three cases of spondylolisthesis, five cases of spondylolysis, and three cases presenting other definite lumbosacral anomalies. Only three cases presented a normal lumbosacral spine. We believe

Fig. 5A

Fig. 5B

Fig. 6A

Fig. 6B

Fig. 7A

Fig. 7B

Fig. 8A

Fig. 8B

these cases present a definite indication of the hereditary background of spondylolisthesis and spondylolysis.

Acknowledgement

Acklowledgement is made to Drs. James N. Fox and W. V. Boudette, Dayton, Ohio; T. C. Hobbs, Columbus, Ohio; Harry E. Elston, Sr., Niles, Ohio; George W. Rea, Kirksville, Mo., and J. P. Oswald, Oakland, Calif.; for their cooperation in permitting me to use their x-rays in this study.

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Fibrocystic Disease of the Pancreas

General Review and Report of Two Cases Occurring in Identical Twins

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Much documentation regarding this uncommon disease has appeared in the literature, especially since Jeffrey's provocative article in 1941.[1] If textbooks on pediatric pathology are not replete with the details of the physiologic pathology and morbid anatomy of fibrocystic disease of the pancreas, journals certainly appear to fill this deficit. Unfortunately, often a static or classical view of the disease and of its altered physiology and the effects on the general body economy are described. Therefore, in this exposition, an attempt will be made to present a dynamic view of the subject, using two cases recently studied by the author as historical background.

"Fibrocystic disease of the pancreas" as a term for a disease entity has its shortcomings because it fails to incorporate the essential changes occurring and sometimes predominating in other organs. Conventionally it has been classified as a disease of altered fat metabolism. In this connection, some of the symptoms and pathology are readily understood. Lowe's[2] studies strongly indicate that the disease is of a hereditary nature, carried by a simple Mendelian recessive gene. My last two cases, occurring in monozygotic male Caucasian twins, would appear to substantiate this conclusion. They are of particular interest since so far as I have been able to ascertain no cases in identical twins have previously been cited. Obviously, even the occurrence in monozygotic twins is not conclusive proof of a hereditary pathogenesis since by living in the same environment they might be exposed to the causal agent or agents simultaneously. Therefore, the observations of Bernardi and Menghi[3] in Italy are of interest at this point. In examining 45 cases of repeated attacks of bronchitis and pneumonia, using appropriate methods, they found no abnormality in blood amino acid following gelatin ingestion or excessive lipids in feces. Further, there were no cases of fibrocystic disease of the pancreas in Milan in 581 infants brought to autopsy (a percentage far lower than stated in large institutions in the United States, and far below my own findings)

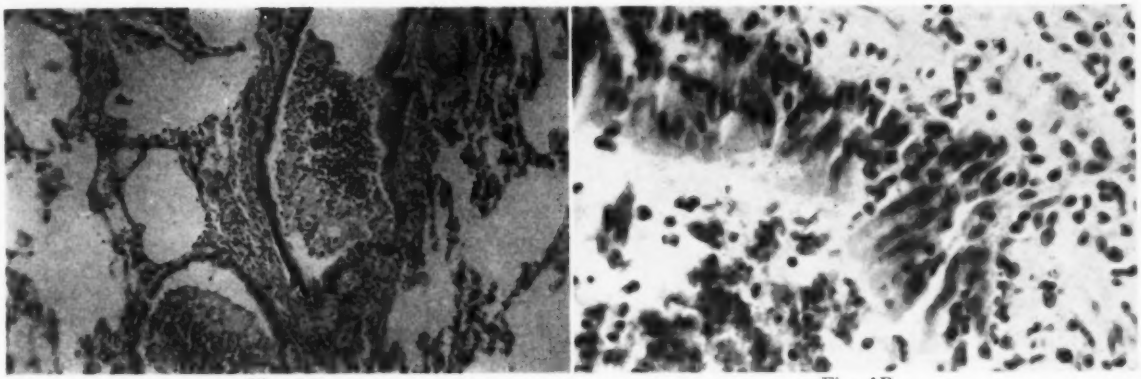


Fig. 1A Fig. 1B

Fig. 1A. Lung, × 10. Note purulent mucoid material filling bronchi and emphysema in surrounding parenchyma. Fig. 1B. Lung, × 44. Edge of bronchus with mucopurulent exudate. Photomicrographs were reduced approximately one third in reproduction.

and no cases of meconeum ileus in 4,686 newborns. Since the disease occurs in this country in many infants of Italian descent, the authors conclude that the rarity of the disease in Italy is predicated upon unknown environmental factors.

THEORIES REGARDING ETIOLOGY AND PATHOGENESIS

A failure of the exocrine function of the pancreas[4] has been suggested as the initial lesion, resulting in vitamin A deficiency. This in turn has been indicted as the cause of epithelial metaplasia in the bronchi and other ducts (that is, pancreatic and bile ducts). Andersen[5] is convinced, by virtue of careful case studies combined with excellent results in the treatment of the disease as a dietary deficiency, that there is no basis for considering the disease primary in the bronchi or their secretions.

On the other hand, Farber[6] has advanced the promising hypothesis incriminating glandular tissues of several systems and their secretions. If the secretions of certain glands should become too viscid and inspissation follow, then we may expect duct obstruction and ectasia, parenchymal atrophy, and fibrosis. To add weight to his argument, Farber showed that young cats placed on heavy doses of parasympathomimetic drugs developed a histologic and clinical picture similar to, if not identical with, that of the disease. However, since the disease is progressive, one must assume the initial lesion is complicated by later manifestations, the result of deficiencies, inflammatory reactions, or other secondary phenomena. Other investigators in the field have supported Farber's thesis, including Zuelzer and Newton;[7] Ayers, Stowens, and Ochsner;[8] and Baggenstoss and his associates.[9]

The possibility of a primary congenital pancreatic defect has been advanced[2,10] with the pulmonary changes considered as secondary. However, the obstructive defect of the pancreas cannot be charged as a primary etiologic factor in all cases, and, as in my cases, may be far less important histologically and functionally than the changes taking place elsewhere.

Although secondary infections, frequently fatal, are the rule in these cases, there are those who believe that fibrosis in the organs affected is due to a toxic or inflammatory cause.[11-13] The evidence for this conclusion involves the fact that intranuclear inclusion bodies may be found in the tissues in some cases, suggesting a virus etiology. However, these inclusions have been demonstrated in cells of patients dying of other causes. Further, it has been shown that a decrease or disappearance of pancreatic enzymes in the gut may be expected in a wide range of infectious diseases of childhood.[13] Veghelyi and his coworkers[13] have induced the lesions of the disease in rats by administration of various bacterial toxins, carbon tetrachloride, and by the use of metallic salts.

Etiology notwithstanding, the evolution of the disease generally takes the following pattern: In the

Fig. 2A. Pancreas, × 10. Note dilated ducts and faintly staining secretions retained. Fig. 2B. Pancreas, × 44. Precipitated protein secretion more readily visualized on high power. Photomicrographs were reduced approximately one third in reproduction.

Fig. 2A

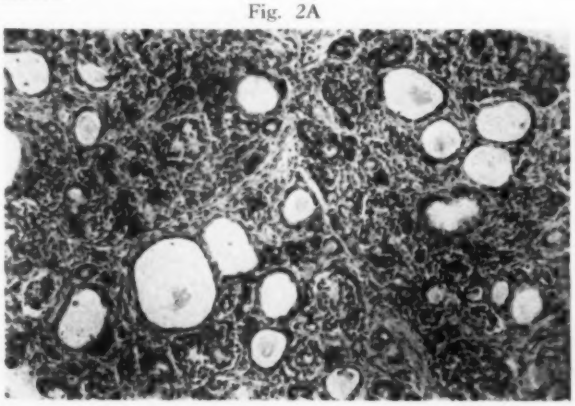
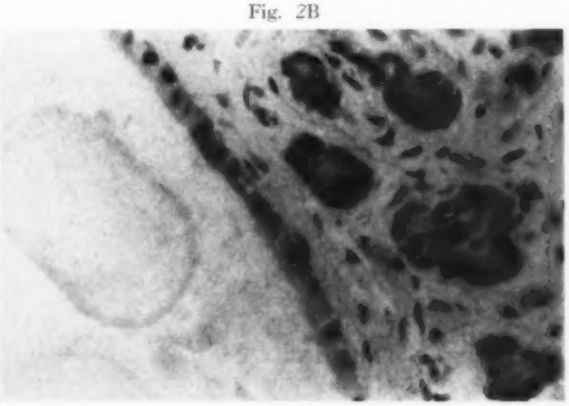


Fig. 2B



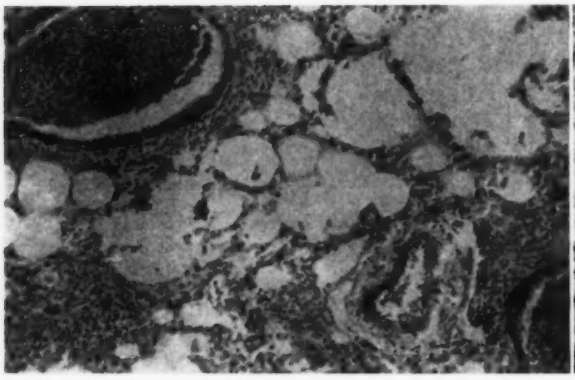


Fig. 3

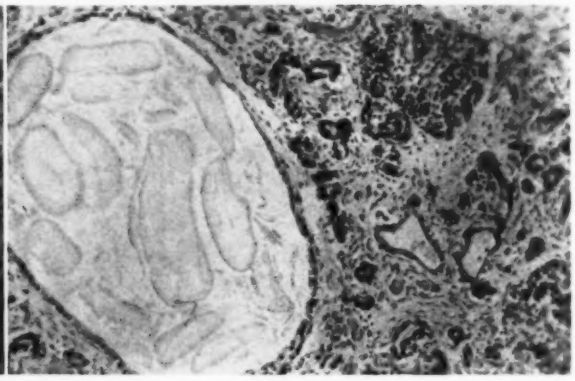


Fig. 4

Fig. 3. Lung, × 10. The resemblance to Fig. 1A (showing pulmonary state of twin brother) is striking. Fig. 4. Pancreas, × 10. Note well-preserved islet of Langerhans in upper right portion of photomicrograph. Photomicrographs were reduced approximately one third in reproduction.

immediate postnatal period or perhaps in fetal life, the mucus-secreting glands of the body elaborate an abnormal product, too viscid to be moved along with ease. This results in gradual blocking of ducts, predominantly those of the pancreas, lungs, and gallbladder. Pancreatic function as an exocrine organ is disturbed by degrees, the degree depending upon whether the lack of digestive enzymes is partial or complete. Absence of lipase results in steatorrhea and loss of ingested fats and fat-soluble products, including vitamin A. Therefore, along with the disastrous effects of nutritive failure regarding fats, all of the complications of vitamin A deficiency must be added. Unfortunately, these complications include epithelial metaplasia, which, when occurring in the ducts of the organs under consideration, only intensifies the disease.

Lack of protein- and carbohydrate-splitting enzymes is not as apparent as other deficiencies because of their adequate supply elsewhere (salivary glands, stomach, and intestinal mucosa). However, when proteases, et cetera, are absent, the meconium of the infant may fail to liquefy and consequently may obstruct the intestine, usually at the ileocecal valve. As many as 20 per cent[14] of the cases of cystic fibrosis of the pancreas may present this phenomenon. Within the pancreas atrophy of the parenchymal cells with replacement fibrosis will commonly be found. The islets of Langerhans are usually spared. A moderate secondary infiltration with mononuclear cells may accompany the process.

The lungs suffer a similar fate. The plugging of the bronchi leads to bronchiectasis and the preparation of a nidus for secondary infections. Obstructive emphysema or atelectasis may occur. Fatal asphyxia and/or bronchopneumonia are common terminal events.

LABORATORY FINDINGS

In any case in which an infant fails to gain weight, exhibits steatorrhea or ileus, and/or chronic respiratory infection, the diagnosis of cystic disease of the pancreas should be entertained.

1. Stools
   a. These may be examined for fat and, if excessive, the diagnosis is supported although not proved.
   b. If trypsin activity is absent, the diagnosis is strongly suggested. When trypsin is present a bacteriologic determination for gelatin-liquefying organisms should be made to rule out a false positive test.
2. Duodenal contents
   a. Lipase and trypsin activity are decreased in the disease.
   b. Viscosity is abnormal and may show alteration before trypsin change is evident.
3. Low serum cholesterol
4. Flat vitamin A absorption curve following ingestion of measured amounts of vitamin A.

CASE HISTORIES

After delivery of identical twins, 3 months previous to the present admission, the mother stated that neither child gained weight well and both had a constant "cold." The infants were pale, poorly nourished, with harsh rales throughout the lung fields and a low fever. One had been hospitalized elsewhere for pneumonia, but the diagnosis was changed to pertussis and the patient transferred to our contagious disease ward. The infant remaining on the pediatric ward lost weight rapidly and failed to respond to antibiotic therapy. His white blood count was 25,000 per cu. mm. with a predominance of polymorphonuclears. Little more than 10 days after admission, during which time his pulmonary symptoms were marked, he developed severe respiratory distress with sternal retraction and cyanosis and expired. Autopsy revealed thick plugs of mucus in the tracheobronchial tree completely obstructing the air passages (Figs. 1a and 1b). Pseudomonas aeruginosa was isolated from this material. The pancreas demonstrated characteristic changes of the disease, but these were not as advanced as those of the pulmonary organs (Figs. 2a and 2b).

Upon autopsy diagnosis of this case, the indicated diagnostic procedures were immediately instituted in the twin. Lipid studies of the stool showed only a moderate amount of fat. Trypsin determinations, using the gelatin liquefaction technic,[15] likewise showed normal enzyme activity and the absence of gelatin-liquefying bacteria in the stools. Pseudomonas aeruginosa was cultured from material aspirated from the trachea and larynx. Nevertheless, the pulmonary signs and symptoms, radiographs showing an upper respiratory infection, patchy atelectasis, and the diagnosis in the twin convinced the attending physicians that the disease was undoubtedly the same as that affecting

(Continued on page 170)

THE JOURNAL OF THE AMERICAN OSTEOPATHIC ASSOCIATION

Published monthly by the American Osteopathic Association

Publication Office, 100 S. Kenilworth Ave., Oak Park, Ill.
Editorial Office, 212 E. Ohio St., Chicago 11, Ill.
Address all communications to the Chicago Office

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Subscription . . . . . Ten dollars a year in advance

Vol. 53 **November, 1953** **No. 3**

1953 CLINICAL ASSEMBLY AT LOS ANGELES

The 1953 Clinical Assembly of five specialty and affiliated groups of the American Osteopathic Association was characterized by an astute observer and registrant as one of the noteworthy conventions in the profession's history and one especially significant in its developmental aspects. For the American College of Osteopathic Surgeons it was the twenty-sixth meeting. Again, as in recent years, there were four other participating organizations, the American Osteopathic Hospital Association, the American Osteopathic College of Radiology, the American Osteopathic Academy of Orthopedics, and the American Osteopathic Society of Anesthesiologists. For this last organization it was a historic meeting; the Society reorganized as the American Osteopathic College of Anesthesiologists, having been granted its new status in July by the Board of Trustees of the American Osteopathic Association.

As in 1952, the opening of the Annual Meeting of the Osteopathic College of Ophthalmology and Otorhinolaryngology coincided with the closing sessions of the Clinical Assembly. Such a time and geographic relationship establishes a continuity that is more than apparent, since it affords an opportunity for meeting of individuals. The thirty-eighth Annual Meeting of this oldest of the profession's specialty groups will be reported later.

The attendance of the Assembly was representative of the entire country. Air travel from coast to coast, now accomplished in a relatively few hours, has largely wiped out the regional character of national meetings. Attendance figures showed total registrants to number approximately 900. Both the College of Surgeons and the participating organizations were pleased with their attendance, indicative as it was of the growing interest and serious consideration and approval given to clinical meetings. Attendance in all groups was augmented by guests.

The Assembly proper revolves around the College of Surgeons, a normal sequence of events due to many factors; it began 20-odd years ago as an assembly of surgeons. Members of the College of Surgeons still constitute the majority of registrants, and, as a specialty within osteopathic medicine, surgery occupies a ranking position. The four participating organizations, however, are entirely independent of the College, each making a distinctive contribution to the profession which they all serve. Their union with the surgical group in a clinical session is symbolic of the interdependence of all the constituent groups even though they maintain perfectly their autonomy. This symbiotic relationship is one of the factors which increasingly is rendering these assemblies notable occasions in the continuing advance of the osteopathic profession.

OPENING PROGRAM

As has now become traditional, the formal opening of the Assembly occurred on Sunday evening following the preconvention week, which had been partly filled with meetings of various boards, committees, and other policy-making and executive bodies. President James O. Watson of the College of Surgeons called the Assembly to order at 7:30 p.m., October 18, in the beautiful Pacific Ball Room of the Hotel Statler, Los Angeles. Seated on the platform with Dr. Watson were Drs. J. Armande Porias, president of the College of Radiology; Warren G. Bradford, president of the Academy of Orthopedics; J. Craig Walsh, president of the Society of Anesthesiologists; Mr. E. L. Herbert, president of the Osteopathic Hospital Association, the Reverend Clarence W. Kerr of Los Angeles who gave the invocation, Dr. W. Donald Baker, general chairman of the Assembly, and Mr. John Anson Ford, chairman of the Board of Supervisors of Los Angeles County. President Watson responded to the official welcome by Mr. Ford to Los Angeles and announced that the Annual Trenery Lecture of the College of Radiology would follow. All registrants were invited to remain for this important event.

The Trenery Lecture has become much more than a portion of the radiologists' program; it is a traditional event shared by the entire Assembly. It was founded in 1943, shortly after the untimely death of Floyd B. Trenery, whose contribution to the development of radiology in osteopathic medicine is beyond estimation. This year's Lecture bore a special significance since it was in California that Dr. Trenery lived the major portion of his professional life. Los Angeles was the scene of his outstanding professional achievements which overflowed in an organizational form throughout the profession. The Trenery Lecture for 1953 was delivered by Bertram V. A. Low-Beer, M.D., associate professor in the Department of Radiology at the University of California, Berkeley. He spoke on "Isotopes—Today and Tomorrow." Dr. Low-Beer

was the first to receive the bronze Trenery medal, long planned to be given each year to the designated speaker. The medal was designed by a distinguished artist and the die cast by well-known silversmiths of Philadelphia. The Lecture is scheduled to be published in the near future as a special article in THE JOURNAL.

SCIENTIFIC PROGRAMS

The scientific programs began in part on Sunday, October 18, and continued through Wednesday, October 21. The College of Radiology and the Academy of Orthopedics, as is their custom, held a combined meeting on Wednesday. The Assembly concluded with a joint meeting on Thursday morning, October 22, at which John W. Cline, M.D., F.A.C.S., spoke on "Medical Education Today and Tomorrow." Dr. Cline is a past president of the American Medical Association and an associate clinical professor of surgery at Stanford University School of Medicine.

COLLEGE OF SURGEONS

The daily programs of the College of Surgeons began Monday, October 19. Surgical clinics were held at 8 a.m. Monday, Tuesday, and Wednesday mornings at Burbank, Doctors, Glendale, Maywood, Monte Sano, Park View, San Gabriel Valley, and Los Angeles County Osteopathic hospitals. All are well-known osteopathic institutions in Los Angeles and vicinity. Admission to the surgical clinics was necessarily by special ticket, so that the large number of registrants unable to attend were given an opportunity to view special request films from 8 to 9 a.m. daily. Color films depicting surgical operations were scheduled regularly throughout the sessions through the courtesy of Davis and Geck, well-known manufacturers of surgical supplies. Frank F. Schade, M.D., Los Angeles, Chief of the Medical and Health Service of California, State Region 9, Civil Defense, and Michael B. Shimkin, M.D., Chief, Laboratory of Experimental Oncology, University of California School of Medicine, appeared on the programs as guest speakers. Dr. Schade's topic was "Civil Defense," and Dr. Shimkin spoke on "Quacks and Cancer." The excellent program for 1953 was made possible by the careful planning of Dr. J. Willoughby Howe of Hollywood.

The Annual Conclave of the College, at which all registrants were the guests, was held in the Pacific Ball Room on Monday evening. This significant social and ceremonial event centers around the inaugural of the incoming president, acknowledgment of candidates for future membership, roll call of new members, charge of the College to the class, award of the degree of fellow, and the bestowal of life membership. Life membership was granted to Drs. T. J. Ruddy, Los Angeles, and M. S. Slaughter, Webb City, Mo.

The degree of fellow was awarded to the following osteopathic physicians: Howard C. Baldwin, Tulsa, Oklahoma; Wesley S. Carey, Oakland, California; John A. Costello, Los Angeles; J. Paul Leonard, Detroit; W. H. Riche, Independence, Missouri; and K. George Tomajan, Boston; and posthumously to Frank A. Piazza, who practiced in Long Beach, California.

The new president of the College is Dr. James M. Eaton. Dr. Eaton is chief attending orthopedic surgeon of the Osteopathic Hospital of Philadelphia and a member of the faculty of the Philadelphia College of Osteopathy. Dr. J. Willoughby Howe was named president-elect.

A key figure in the development and growth of the College of Osteopathic Surgeons has been its secretary-treasurer, Dr. Orel F. Martin, Coral Gables, Florida. Through the cooperative assistance of Mrs. Esther Martin, Dr. Martin has been able to carry out the continuously expanding program of the group, despite his illness. However, recently the College yielded to his long insistence and relieved him of his official responsibilities. Dr. Charles L. Ballinger, Toledo, Ohio, a former president of the College, was elected secretary-treasurer. The post of administrative secretary was created, and was filled by Mrs. Martin whose familiarity with every detail of the College administration is a matter of profession-wide knowledge. Dr. Martin was named as consultant to the Board of Governors. This rearrangement of administration is evidence not only of the high regard and appreciation of Dr. Martin's associates, but proof of the confidence and trust with which he and Mrs. Martin are held.

Newly elected as a member of the Board of Governors was Dr. Milton V. Gafney, Dallas, Texas. Drs. H. J. McAnally, Kansas City, Missouri, and Troy L. McHenry, Los Angeles, were re-elected for 3-year terms.

OSTEOPATHIC HOSPITAL ASSOCIATION

The number of osteopathic hospitals which increases month by month and the growth, development, and expansion of existing hospitals would make the formation of a hospital association necessary if an effective and experienced organization were not already in existence. Under the able leadership of its first years the Hospital Association laid a foundation strong enough to uphold its own growth. During the past year it has been carefully and conservatively guided by President E. L. Herbert, superintendent of the Chicago Osteopathic Hospital, at the same time that a new policy of assistance to member hospitals was being developed by the executive secretary, Robert P. Chapman, Davenport, Iowa. Mr. Chapman, but a year with the Association, becomes its full-time executive officer. The excellence of the carefully planned program was reflected in the large attendance throughout the week. The value of the Association's leadership has become so great that no osteopathic institution should attempt to go its way alone. It reports an institutional membership of approximately 200 distributed over thirty-three states.

Mr. Herbert was re-elected president of the Association; Mr. Keith Bowker, Flint Osteopathic Hospital, was made president-elect; Mrs. Alixe P. Nuzum, Des Moines General Hospital, and Mr. Wayne P. Annis, Doctors Hospital, Los Angeles, were elected as the first and second vice-presidents respectively. Dr. R. F. Lindberg, Detroit Osteopathic Hospital, continues as secretary-treasurer of the Association.

COLLEGE OF RADIOLOGY

As a result of the experienced planning of program chairman Dr. C. A. Tedrick, Phoenix, Arizona, a veteran and founding member of the College, the radiology program reached its usually high standard of excellence. Dr. Tedrick assumed the office of president; Dr. John H. Pulker, Flint, Michigan, was elected president-elect; Dr. Jesse P. Oswald, Oakland, California, vice president; and Dr. H. Miles Snyder, Detroit, was re-elected secretary-treasurer. Dr. Pulker will be the program chairman for 1954. Newly elected members of the executive board are Drs. Dwight A. Stiles, Phoenix, Arizona, and A. G. Reed, Tulsa, Oklahoma. Dr. D. W. Hendrickson, Wichita, Kansas, former executive board member and president of the College, was again elected to the executive board.

The Trenery dinner, which was held Tuesday, October 20, in the Foy and St. Louis rooms of the Statler, honored Mrs. Gertrude Trenery, widow of Dr. Trenery, and his daughter, Mrs. Marian Trenery McFadden, both of Glendale, California. The occasion was the presentation by the College of the first Trenery medal, struck in silver, to Mrs. Trenery. Dr. J. Armande Porias presided, introducing Dr. C. A. Tedrick who spoke of Dr. Trenery's intimate connection with the initiation of the Board of Radiology, the first certifying board of specialists in the osteopathic profession, and his interest in the development of the College itself. Presentation of the medal to Mrs. Trenery was made on behalf of the College and in the enforced absence of Dr. Paul Lloyd, Philadelphia, by Dr. Raymond P. Keesecker, Chicago, former radiologist and president of the group. Present at the dinner were members of the College and friends of Dr. Trenery from other organizations.

ACADEMY OF ORTHOPEDICS

The program of this group attracts many osteopathic physicians, and this year was no exception. As a guest speaker, Miles H. Anderson, Ed.D., aroused great interest by his paper on prosthetic appliances and the actual demonstration by a quadruple amputee that he was able to accomplish for himself everything incident to everyday living.

Dr. Charles H. Brimfield, York, Pennsylvania, was elected to the presidency of the group, and Dr. Walter R. Garard, Los Angeles, vice president and program chairman for 1954. Dr. J. Paul Leonard, Detroit, was re-elected as secretary-treasurer. Drs. Jack M. Wright, Toledo, Ohio, and Charles M. Hawes, Richardson, Texas, were elected associate secretary and associate program chairman respectively. The board of directors for the coming year is composed of Drs. Warren G. Bradford, and Donald Siehl, Dayton, Ohio; Robert O. Fagan, Des Moines, Iowa; Karl P. B. Madsen, Oakland, California; Arthur E. Miller, Los Angeles; and Wallace M. Pearson, Kirksville, Missouri.

SOCIETY OF ANESTHESIOLOGISTS

This was the last year for the Society as such, and with its dissolution the American Osteopathic College of Anesthesiologists came into existence. An excellent program from within the group was supplemented by several guest speakers, among whom were John B. Dillon, M.D., associate clinical professor, surgical anesthesia, University of California at Los Angeles; J. Francis Dammann, Jr., M.D., and Marvin L. Darsie, Jr., M.D., all of Los Angeles.

During the period of transition to College status it was deemed advisable to hold over the officers of the Society. Dr. J. Craig Walsh, Philadelphia, remains president; Dr. William A. Gants, Providence, Rhode Island, vice president; and Dr. Crawford M. Esterline, Kirksville, Missouri, secretary-treasurer. Dr. J. Calvin Geddes, Mt. Clemens, Michigan, was made president-elect. Dr. A. L. Karbach, Arlington, Texas, will be the 1954 program chairman.

Administration of the new College will be effected through its newly constituted board of governors with the following members: For 1 year—Dr. J. Morris Howlett, Detroit; for 2 years—Drs. Claire E. Pike, Long Beach, California, and Mahlon Ponitz, Detroit; for 3 years—Drs. K. George Tomajan, Boston, and Amanda Marshall, Los Angeles.

The membership in the College is divided into four categories: fellows, members, associate members, and honorary members. The first group of fellows consists of the founding members and officers of the College.

Organization of the College of Anesthesiology is an event of major importance in osteopathic medicine. This move comes as a logical sequence in the development of the specialty of anesthesiology, the significance of which was pointed out by an editorial[1] in THE JOURNAL a year ago. Recognition of this group by the Board of Trustees of the American Osteopathic Association comes as a reward for 6 years of organizational labor and high professional achievements of its membership.

SCIENTIFIC EXHIBITS

This section was presented at the College of Osteopathic Physicians and Surgeons. Among the exhibits a special Isotopes Demonstration was arranged by S. D. Larks, M.S., Los Angeles, biophysicist, and associate professor at the College.

TECHNICAL EXHIBITS

This section was not large but the twenty-two exhibits were those of well-known firms, each of definite interest to members of participating organizations.

MEDICAL EDUCATION

The one osteopathic college located beyond the Rocky Mountains and on the West Coast attracted many registrants as visitors, and all reported most favorable impressions. Doctors who had not seen the school for more than 3 years were particularly enthusiastic over the progress made in that time. The availability of Los Angeles County Osteopathic Hospital as the teaching hospital for the school strengthens its program greatly.

The presence of the school gave a concreteness and special interest to the address by Dr. Cline before

1. Editorial: Anesthesiology. J. Am. Osteop. A. 52:117-118, Oct. 1952.

the closing session of the Assembly. Dr. Cline traced briefly the development of medical education in America from the time of the numerous medical schools existing for profit in 1905, to the present seventy-two A.M.A.-approved medical schools, all of which, public and private, are entirely nonprofit. He distinguished between the greatly increased demand for medical services and the actual need for more physicians. In his opinion doctors in the United States today are not in short supply.

Last year's graduates of medical schools—not counting graduates of osteopathic schools—numbered 6,668. Dr. Cline reported 27,688 undergraduates engaged in medical training; this number includes those in basic science schools. He called attention to the fact that the number of doctors in residency training is more than double that in intern training; there are 7,000 interns and 16,000 residents.

The speaker defined medical education as the creation of physicians, a process which is a lifelong project, so that the physician should expect postgraduate training to extend throughout his life. He emphasized medical education today as a dynamic and not a static process.

Medical education of tomorrow, Dr. Cline suggested, could be projected by an objective examination of current trends. Medical students today are treated as adults, with emphasis upon independent work by the student. The inculcation of medical knowledge today, therefore, becomes less spoon-feeding of facts with less worthless attention to detail and much greater attention to the principles of medical reasoning.

The patient is given more consideration as a total individual. Medical schools are striving to perfect the technics of that kind of approach, according to Dr. Cline. While no entirely acceptable method of modern teaching has yet been worked out by any one school, Western Reserve University of Cleveland is now engaged in the most striking modification of the standard medical program.

Dr. Cline outlined briefly the method of joint inspection of medical schools by the Council on Education of the American Medical Association and the Association of Medical Colleges, emphasizing the fact that the essentials for the creation and maintenance of a school of medicine are now well known. He foresaw medical education of the future as correlating all lines of knowledge with actual training in medicine, that the end product might be the informed and skilled physician prepared to care for the total man.

The speaker gave evidence of a wide theoretical and practical knowledge of medical education today, and a concept of the physician as one not only skilled in his field but mindful of a wide social responsibility.

Properly, there were no references to controversial issues between doctors of medicine and doctors of osteopathy or to the current study being conducted by state medical societies on the relation between the two schools of medicine.

Dr. Cline's address revealed the man as he is—student, educator, physician, and citizen, mindful of his responsibilities to the public as a leader in the field of medicine. His presence and his talk were appreciatively received by the large body present to hear him.

1954

The 1954 Clinical Assembly is scheduled for Dallas, Texas.

THE CHRISTMAS SEAL CAMPAIGN, 1953

In 1952 but one osteopathic physician in five was aware of the opportunities of osteopathic Christmas Seal promotion. Of the entire profession and the Auxiliary to the American Osteopathic Association only 17 per cent made personal contributions. And only 2 per cent of these solicited contributions from the public. Eighty per cent of the members of the osteopathic profession were nonparticipants in the annual Christmas Seal campaign. Almost one half of the total proceeds came from persons outside the profession and the Auxiliary!

Osteopathic Christmas Seals are 22 years old. Why such professional apathy if the effort is a worthwhile one? For 18 years Christmas Seals were an acceptably quiet venture of organized osteopathy—you bought if you liked. Four years ago it was realized that Christmas Seals constituted an ethical way of presenting the osteopathic profession to its public and making that public a participant with the profession in an activity of high order—raising funds for student loans and for research in osteopathic medicine. Here was a goal worthy of a campaign.

In 1952 the fourth expanded campaign tripled the amount of public giving over the first expanded campaign of 1949. That the public will respond gladly has been proved. But it must be given the opportunity. It is the doctor of osteopathy who can open the door.

Technics for the 1953 campaign have been perfected on the basis of experience in the years following 1949. Mrs. Ann Conlisk, director of the drive, will be in charge, employing the "packet plan" in which the profession and the Auxiliary act as a liaison between the seals, the organization, and the public. The machinery for an effective campaign has been built, tested, and found workable. Campaign machinery is expensive to maintain but properly utilized it will pay high dividends. The profession can well be expected to give the seal campaign its widest support in 1953.

Osteopathic Christmas Seals not only aid the student loan fund, which receives 50 per cent of the proceeds, and the Bureau of Research projects to which is allotted the remainder, but they also constitute the best known method to channel public opinion favorably toward osteopathic medicine.

SPECIAL ARTICLE

Medical Aspects of the Atomic Explosion

W. KENNETH RILAND, D.O.
New York City

Editor's Note: This article comprises the introduction and first three lectures used by Dr. Riland in 1951 for civilian defense training of employees of the United States Steel Corporation. The remainder of the lectures and the examinations given at the conclusion of the course will be published in succeeding issues of THE JOURNAL. *They are published in* THE JOURNAL *because they are basic to such training even though some changes in approach have been effected since the time the training course was organized. While the course was organized by Dr. Riland for training employees of a single company over whom he could exercise greater control than is generally possible in civil defense training programs, it will be applicable by other osteopathic physicians directing preparation for catastrophic situations. Situations of such nature may arise from causes other than the atomic bomb.*

INTRODUCTION

The application of nuclear fission to the arsenal of war and the threat of use of atomic weapons upon densely populated civilian centers have created medical problems of unprecedented magnitude. The concept of emergency medical supplies has of necessity undergone radical changes. These changes have been made necessary from the standpoint of additional factors brought into being by the atomic bomb, the overwhelming number of casualties its use would produce, and the availability of medical supplies at present.

The materials making up a casualty kit have been drastically revised because of limitations on materials and because of the multiplicity of injuries which may occur in a single individual as a result of atomic explosion. Emphasis has been placed on as abundant a supply as possible of basic items most likely to maintain life for a maximum of 3 days, which might elapse before the injured could be moved to a medical center. The antibiotics have dramatically reduced the liability to infections and their inclusion in the casualty kit reduces the amount of anti-infectives necessary and allows greater supplies of other materials. On the other hand, the inclusion of antibiotics places greater responsibility on the personnel of the casualty groups than has been placed on these groups heretofore.

The entire medical personnel of our building may be eliminated by the detonation of an atomic bomb, thus leaving the care of the injured entirely in the hands of the trained casualty squads for as long as 3 days. The entire training program for these squads is based upon this possibility, and an attempt will be made to instill in each trainee a sense of responsibility and self-confidence. The length of the course and the opportunities for practical application and practice will in the event of an emergency afford the maximum protection to the injured.

LECTURE I

I. GENERAL PRINCIPLES OF ATOMIC EXPLOSION

Statements Regarding Situation Today.—

1. We hope there never will be an atomic war, but we cannot assume that there will never be one. In fact, we must act as if one were certain. We cannot leave to chance or to last minute preparation the training which will cut down the enormous casualties which will occur if these new bombs are used upon densely populated civilian centers.

2. Atomic bombs may cause injuries in four different ways and in combinations never before faced by mankind; they are (a) blast, (b) heat or thermal radiation, (c) nuclear radiation, and (d) psychologic damage.

(a) Blast: It is estimated that 85 per cent of injuries will be due to direct or indirect effects of blast. The blast wave is of relatively long duration for an explosive factor, being of one second duration compared with a few milliseconds for TNT. Certain portions of buildings, as glass, are less resistant to blast than others. The removal of glass tends to equalize pressures externally and internally. It has been estimated that between 40 and 50 feet of rubble will fill the streets of this section as one of the effects of blast.

The effects of blast upon the human body are of two types: direct and indirect.

Direct. An individual subjected to direct effects of blast or shock wave may suffer internal injuries to organs without apparent or noticeable effect to the observer (these will be taken up at a later session).

Indirect. The indirect effects of blast are legion. Falling timber, walls, and desks, in fact all heavy objects which the individual is thrown against or which are thrown upon the individual, will give rise to many and varied injuries.

(b) Heat or Thermal Radiation: Roughly, one third of the total energy released by an atomic bomb is in the form of thermal radiation. It is equal to 8,000,000 kilowatt hours of electrical energy of 300,000+ degrees Centigrade of temperature which are released 0.1 millisecond after detonation. The heat covers the entire spectrum, resembling that of the sun. The ultraviolet, visible light, and infrared rays thereby produced do not have a high degree of penetration, so that any solid object between the explosion and the individual affords a measure of protection. The burn-producing factors are of extreme intensity, but of very short duration. In individuals close to the blast, burns and blisters occur within 5 minutes. At 1,500 meters, burns appear in 2 hours and blisters in 5 or 6 hours. The effects upon the eye are relatively few because of the anatomic shielding effects of the skull and the practically instantaneous blink reflex. However, blindness may occur which lasts from a relatively few moments to several hours. A striking feature of atomic burns is the pigmentary change which is characteristic. Clothing has a protective effect, depending upon several factors: (1) distance, (2) color, (3) tightness, and (4) number of layers.

(c) Nuclear Radiation or Radioactivity: Atomic explosion liberates radioactivity approximately equivalent to 1,000,000 tons of radium. The nuclear radiation consists of alpha, beta, and gamma rays and neutrons. The neutrons and some of the gamma rays are emitted in the actual fission process, that is, with the explosion, while the remainder of the gamma and the beta particles result from normal radioactive decay of U 235 which has not undergone fission. Radiation can be considered as initial and residual. Residual radiation is not important, relatively speaking, unless the blast is an underwater blast, which liberates radioactive sodium of a residual nature. The range of alpha and beta particles is so small that they cannot penetrate to the earth, but the gamma rays and the neutrons have penetrating power, and, in addition, they produce harmful effects upon living organisms.

Gamma rays are invisible electromagnetic waves similar to x-rays, which have marked penetrating ability.

Neutrons are invisible particles from the fissioning of atoms, which have great speed and penetrating ability.

The energy of the gamma rays produced in atomic explosion is about 3 per cent of the total energy of the explosion and a similar percentage is produced by the decay of material which has not undergone fission. The neutrons emitted in atomic fission account for 3 per cent of the total energy of

atomic explosion and more than 99 per cent of the neutrons are produced immediately, probably within 10^{8} seconds of the explosion. Shielding from thermal radiation is relatively simple, but this is not true of gamma rays or neutrons. For example, at a distance of 3,000 feet from ground zero, the initial nuclear radiation would prove fatal to 50 per cent of human beings within the area even if they were protected by 12 inches of concrete. However, at 7,000 feet such nuclear radiation would be harmless without shielding but the thermal radiation at this latter distance could produce serious skin burns.

The problem of nuclear radiation from a medical standpoint is essentially that of dosage. The gamma rays and the neutrons penetrate deeply into the body; they are absorbed in the respiratory process and through wounds. They ionize the atoms which make up the various elements of the body, such as carbon, nitrogen, et cetera. Therefore, these body atoms are no longer neutral in electric potential, and by virtue of their becoming either positive or negative, they violently react chemically, changing the normal relationship of proteins, enzymes, and other normal constituents of cells. In this manner cells are killed, toxic changes take place, and normal cellular and body activity is disrupted, giving rise to a syndrome known as radiation sickness.

Dosage of radiation is measured in units called "roentgens," with a symbol of "r," which are defined as that amount of x-radiation which, on passing through 1 cc. of normal air, produces 1 electrostatic unit of ions. For our purposes, we are interested in the number of r units to which *an individual has been subjected and the area of the body exposed.*

Everyone who has ever been x-rayed has been subjected to nuclear radiation. In fact extensive x-ray examination, for example, of the gastrointestinal tract, can give a dosage approaching 25 r. Whole body radiations up to 100 r have been given for various pathologic conditions in many instances. In relation to the treatment of radiation sickness as a result of atomic bomb explosion and for evaluation purposes the median lethal dose is considered to be 400 r, or, in other words, this is the maximum dose to which an individual can be subjected and have a chance for survival. It must be remembered that even this figure is qualitative for much depends upon the state of health of the individual at the time of exposure.

The blood cells, and particularly those specializing in antibody formation, are most sensitive to the effects of radiation. For this reason it is imperative that immunizing procedures be completed before possible exposure to radiation. The blood changes which take place even with a 200 to 300 r dose preclude the possibility of successful immunization. This reason alone makes it necessary for each member of the casualty staff to have tetanus toxoid as soon as possible.

(d) Psychologic Damage: There are many misconceptions concerning atomic explosion, and as we go along with our course, many aspects will become less frightening. Among those aspects are residual radioactivity, poisoned water, poisoning of the ground, sterilization, cataracts, and a host of others.

II. NERVE GAS

In the final weeks of World War II the United States forces captured a vast store of a new poison gas which, fortunately, the Germans had not used. The Russian forces at that time also captured a like quantity of this poison. This gas is odorless, colorless, and extremely easy to transport. It is the opinion of our Armed Forces that this gas, if any, will be used in case of hostilities, and it may be used in place of or concurrently with an atomic bomb.

A brief outline of the functions of nerve gas follows: A normal nerve ends in a motor end plate from which the nerve impulses stimulate the muscle. The nerve impulse produces a chemical called *acetylcholine* at this motor end plate, which transmits the current of the nerve impulse to the contracting fibers. After this function is over, another chemical *cholinesterase,* nullifies the acetylcholine. The action of the poison gas is to eliminate the neutralizer, cholinesterase; this permits uncontrollable muscular contractions, which result in muscular fatigue leading to paralysis. The symptoms produced by this gas are as follows: (1) Constriction of the pupils, (2) obstruction of breathing, (3) increased salivation, (4) increased sweating, (5) muscle spasms, (6) intestinal spasms, (7) spasm of the diaphragm, (8) overactive adrenals, (9) excess mucus, (10) paralysis of the brain and respiratory center, and (11) death.

Fortunately, an antidote has been found which, if used soon and often enough, can bring about recovery. This antidote is atropine sulfate. Handling nerve gas casualties necessitates the organization of "gas teams" to receive more detailed explanation and illustrations of treatment.

LECTURE II

ANATOMY AND PHYSIOLOGY

Anatomy is the study of the structure of the component parts of the body; physiology deals with the activity or function of these parts. The anatomy and the physiology of the body, working as a unit, support and maintain life. Interruption of this normal relationship leads to disease or death.

A group of organs acting together to perform a function is spoken of as a system. The systems of the body are: *Skeletal, muscular, nervous, respiratory, circulatory, digestive, excretory, endocrine, reproductive, and urinary.*

1. *Skeletal System.*—This system consists of bones joined together by ligaments and hinged to permit motion. The functions of the bones are to give form to the body, rigidity and strength to certain parts, and protection to vital organs. In order to permit motion of the body in its entirety, as well as motion of one part, many of the bones are connected by joints. A joint must permit movement and yet provide stability. As a general rule, the greater the range of motion, the less the stability and the greater the susceptibility to injury; the shoulder joint is an example. The movement of one bone upon another is accompanied by the action of the skeletal muscles. To help support the joint and to produce motion in opposite directions, opposing muscles are present; one relaxes when the other contracts. Where the bulk of a muscle would interfere with the use of a part of the body, the main muscle may be located at some distance from the bone it controls. In that case it is connected to the bone by tendons. This is true of the hands and fingers, for most of the muscles are in the forearm.

There are three types of muscles: (a) *Skeletal muscles,* which produce all voluntary motion and are under control of the will; (b) *smooth muscles,* found chiefly in the walls of the stomach, intestines, blood vessels, and organs, and which are not under voluntary control; and (c) *heart muscles,* which also function involuntarily.

2. *Circulatory System.*—The smallest unit of the body is the cell, and each cell maintains itself by developing its own heat and energy, nourishing and repairing itself, and reproducing. To do this it must have at its disposal food and oxygen and must be able to dispose of its waste products. The circulatory system is the transportation system of the body, which brings supplies to the cells and carries away waste products. It consists of (a) the *heart* which pumps the blood and is thus the motivating force; (b) a closed system of vessels consisting of *arteries, capillaries, and veins;* and (c) the *blood,* itself.

Blood: Blood is one of the most important body tissues. Although it is in a fluid state, it is called a tissue and constitutes one-thirteenth of body weight. Its cells are divided into red blood cells, white blood cells, and platelets. The *red blood cells* are primarily concerned with transportation of oxygen to the tissues and carrying away carbon dioxide from the cells. The chief function of *white blood cells* is to defend the body against invasion by bacteria.

The liquid portion of the blood, in which blood cells are carried, is called plasma, 90 per cent of which is water. The remaining 10 per cent is made up of proteins of various natures. Clotting of blood is a complicated mechanism which causes blood to solidify when it escapes from the vascular system. If this did not occur we would bleed to death from minor cuts or bruises.

The Heart: The heart is the motor mechanism which supplies the power to force the blood through the vascular system to nourish the cells. As there are essentially two vascular systems, one to the lungs and one to the rest of the body, actually two pumps are provided. The one on the right side of the heart forces blood through the pulmonary arteries to the lungs, from which it is returned by the pulmonary veins to the left side of the heart. It is then pumped through the aorta to the rest of the body. The force exerted by the contracting heart is sufficient to maintain blood flow and the resistance to this force by the walls of the artery determines the blood pressure.

Blood Vessels: There are three types: *arteries, capillaries, and veins.* The arteries transport the aerated blood to the smaller blood vessels in direct contact with the cells, the capillaries. Oxygen and food are thus supplied to the cells, and waste products given up by the cells are carried back to the lungs by the veins which are also connected with the capillaries.

3. *Respiratory System.*—It is through this system that oxygen is supplied to the tissues and carbon dioxide is removed. The entire respiratory system consists of the *nose and mouth, trachea, bronchial tubes, and lungs,* through which the air is cleaned, warmed, and moistened. *Breathing* is accomplished by increasing and decreasing the capacity or size of the chest which, in turn, performs a pumping action upon the lungs. *Inspiration* is accomplished by the contraction of the muscles which elevate the ribs and a contraction of the diaphragm. *Expiration* is a relaxation of the diaphragm and a depression of the ribs, which forces the air out of the lungs.

4. *Digestive System.*—This system is charged with the responsibility of receiving and preparing food and changing it into products which can be used by the cells of the body for heat and energy, growth and repair. It consists of the *teeth, mouth, esophagus, stomach, small and large intestines, and associated organs,* such as *salivary glands, liver, and pancreas.* In addition, there is an organ which is not a distinct part of the digestive system, but which should be mentioned because of its frequent injury—the *spleen.* It is part of the protective system of the body.

Food entering the stomach is retained for several hours, wherein the first phase in the change of food takes place. It then passes into the upper portion of the small intestine, where it is mixed with other juices produced in the pancreas and the liver, and where it is gradually broken down into suitable products for absorption by the intestinal wall, from which it is passed to the blood stream. These *end products* consist mainly of *water, inorganic salts, glucose,* and *fats. Glucose* is the main fuel for the production of heat and energy. It passes through the portal vein to the liver, where it is stored in the form of glycogen, until needed to maintain a proper sugar level in the blood. As our body cells utilize sugar, replacement is made from the glycogen in the liver. The liver can be likened to an automatic stoker which furnishes a constant supply of fuel to the body by means of the blood.

The main function of the large intestine is to collect and eliminate the waste products of the process of digestion.

5. *Urinary System.*—This system provides the chief method of elimination of other waste products, particularly water and inorganic salts, from the body. It functions more or less in the manner of a filtration system and is composed of the *kidneys,* one on either side of the posterior wall of the abdomen, a few inches laterally from the spine. The urine secreted by the kidneys is collected in a funnel-shaped sack which empties into a *ureter.* The ureters extend downward and empty into the *bladder,* which is directly behind the front part of the pelvis.

6. *Nervous System.*—The nervous system is the mechanism which coordinates all body functions and it is divided into two divisions: (a) *the central nervous system,* composed of the brain and the spinal cord, which controls essentially the voluntary functions of the body, and (b) the *autonomic* or *sympathetic* or *involuntary nervous system,* which controls the involuntary functions of the body. The autonomic system directs the activity of organs, controlling and regulating such actions as heart beat, intestinal motion, secretion of digestive juices, and the expansion and contraction of arteries; it is of particular importance in the circulatory system. In accidents where hemorrhages occur it helps to prevent or delay the development of shock by contracting blood vessels, diminishing the capacity of the vascular system, and thus maintaining blood pressure.

LECTURE III

BURNS

Burns are divided generally into three groups, depending upon the depth of skin damage. However, it is of much greater importance to know the extent of the burns rather than the depth. First degree burns covering a large area can be much more serious than a third degree burn of a small area.

Burns are classified as follows:

First degree—producing reddening of the skin.

Second degree—recognized by the blistering of the skin. As can be readily seen, both first and second degree burns occur together frequently.

Third degree—complete destruction of the entire skin thickness. In this group are included those burns which may involve damage to tissues beneath the skin layers—fat, fascia, muscles, or even bones—in addition to the skin layers. This group is the most serious from the standpoint of immediate danger to life and permanent damage.

Estimation of the amount of surface involved in any given burn can be accomplished by using the table worked out by Berkow. This table is very helpful in determining the prognosis which is usually unfavorable for life if more than one third of the body surface is involved.

Part of Body	Per Cent of Surface
Lower extremities (legs) including buttocks	38%
Neck and trunk	38%
Upper extremities (arms)	9% each 18% both
Head	6%

This table is not an absolute authority for prognosis as many individuals with severe burns totaling more than 38 per cent of skin area, according to the table, have survived. The individual's health at the time of injury, the initial care rendered, and the speed with which the burned individual received treatment are often the determining factors between life and death.

The Skin.—The skin covers the body and protects the deeper tissues from injury, from drying, and from invasion by foreign organisms. It contains the endings of many of the sensory nerves. It plays an important part in the regulation of body temperature and has limited excretory and absorbing powers. It consists principally of a layer of connective tissue named *corium* or *dermis,* and an external covering of epithelium termed the *epidermis.* Beneath the dermis are certain organs with special functions, principally hair follicles, sweat glands, and sebaceous glands. The last are principally concerned with lubrication of the skin. The epidermis, or outer layer of the skin, has little if any blood supply and varies in thickness throughout the body. In some areas, for instance, the palms of the hands and the soles of the feet, it is thick and hard. This is due in part to the amount of constant pressure to which these areas are subjected. In other sections the epidermis is very soft and delicate. The dermis, or true skin, is tough, flexible and highly elastic and also varies in thickness over the body. It is thick on the palms of the hands and on the soles of the feet; thicker on the outer or lateral sides of the arms and legs than on the inner sides, and extremely thin and delicate in the eyelids.

The dermis contains elastic fibers, various types of cells, and numerous blood vessels and nerves, as well as the sebaceous glands, sweat glands, and hair follicles mentioned above.

Effect of Heat Upon the Skin.—Moderate heat leads to relaxation of the walls of the blood vessels and glands contained within the skin. This is a common process which all of us can recognize on any hot day during the summer. With increasing grades of temperature, intimate changes take place within the cells of the skin itself, leading to oozing of serum from the cells. This is best exemplified by a case of moderate or severe sunburn. Higher grades of temperature produce immediate destruction of the cells of the skin itself, with inflammation of the tissue surrounding the area. It is likely that poisonous products are formed either from the fluid which oozes out of the cells or from death of the cells themselves. These poisonous products, called *toxins,* disrupt the function of the skin locally and have widespread effect upon the internal organisms of the body. The blood in the blood vessels in a burned area becomes concentrated and coagulation or clotting of the blood within the blood vessels is not unusual. This gives rise to localized hemorrhages, leading to increased death of tissue, or *necrosis.*

Burns, moderate or severe in nature, have a peculiar and almost instantaneous effect upon such organs as the liver and kidneys, but the basic and fundamental cause of death from burns takes place as a result of shock. Most of the signs and symptoms of shock depend upon one condition—markedly lowered blood pressure. The lowered blood pressure makes it necessary for the heart to increase its pulsations in a sometimes vain attempt to raise the blood pressure and makes increased respiration necessary, thus creating a situation of intense strain upon two vital body functions. The marked fall of blood pressure is at first caused by the decreased amount of blood being pumped by the heart. The veins and capillaries of the body become engorged with blood; hence the heart cannot get sufficient bulk of fluid to pump against.

Because of the markedly reduced amount of blood being circulated and the slow rate of circulation, *acidosis* develops and affects the muscular power of the heart. Also as a result of reduced circulation, increased carbon dioxide content is present which gives an excessive stimulation to the respiratory center of the brain. Another result of the slowed circulation is a loss of the normal heat regulation of the body, which intensifies all the effects of shock. The picture of a person in shock is as follows: *rapid but shallow respiration, fast but feeble pulse, dilated pupils, moist white or bluish-white skin, complete apathy, unconsciousness.* All people subjected to abnormal influences of any type are subject to shock in various degrees. Shock is divided into *immediate and delayed shock* or *primary and secondary shock.* From the above it can be seen that the principal result of excessive temperatures upon the human body is shock.

Evaluation of the Patient.—The initial survey of the status of a burned person should include the following considerations: (1) extent of burn, (2) depth of burn, and (3) presence of shock.

As was mentioned before, the extent of the burn is more significant in estimating prognosis than its depth, and a burn of only superficial depth over a large surface area is a greater threat to the survival of the patient than a small burn of great depth. Extensive superficial burns are likely to produce marked blood concentration while deep burns are more likely to produce shock and destruction of red blood cells.

Treatment of Burns.—The treatment of burns resulting directly or indirectly from atomic explosion is, at present, a highly debatable procedure. The present recommendation of federal authorities connected with the Office of Civilian Defense is to cover a burned area with a sterile, dry bandage, which is to remain in place undisturbed until the burned individual is removed to a casualty station or an evacuation hospital. This recommendation, I am afraid, is based upon the fact that very few basic supplies will be available in sufficient quantities to provide any other treatment. Our particular problem is not quite so desperate. I, personally, would not want to have a burn, no matter how severe, treated by the application of a dry dressing. One of the greatest steps forward in the treatment of burns was made after the disastrous Coconut Grove fire in Boston in the early part of the last war. People survived more extensive burns than had ever before been successfully treated. The treatment used was covering the burned area with sterile Vaseline, covering the Vaseline with sterile bandage, and maintaining an even pressure, but not enough to block off the blood supply to the burned area. These so-called *Vaseline pressure packs* were kept in place until the odor from the patient was well nigh unbearable. This mode of treatment protected the exposed and sensitive cells of the skin and other tissues, and, by virtue of not being disturbed, allowed nature's healing process to have its maximum effect. A modification of this treatment is what we propose for the treatment of burns if our building is subjected to atomic explosion.

The local treatment of a burned area is only one phase of the over-all treatment of burns. More important at the outset than the treatment of the burned area itself is the control of pain and the instigation of shock therapy. Pain is controlled by *morphine sulfate* injections. The control of shock is somewhat more arduous and every bit as important. The prime factor in the treatment of shock is the maintenance of fluid balance; and as you will recall in my outline of the mechanics of shock, there is a gross escape of fluid from the blood system of the body into the tissues, producing concentration of the blood. And you will remember, I hope, in the lecture on anatomy, I stated that the fluid portion of the blood consists of about 90 per cent water.

1. The patient with superficial burns of moderate extent, showing no evidence of shock, must be told to take one can of our rationed water immediately and rest for 5 minutes before being assigned to any work.

2. The patient with moderate or severe burns, evidencing any degree of shock, should have 1,000 cc. of *normal saline solution* intravenously. During intravenous administration of this normal saline solution, body heat must be maintained. Therefore, any available material, such as rugs, window drapes, or clothing from the dead, must be placed on and around individuals moderately or severely burned. No fluid should be given by mouth to an individual suffering a marked degree of shock. Not only will the patient be unable to swallow this water, but the water so given will be wasted; and we will have many uses for every drop of available water. During the introduction of normal saline, *600,000 units of penicillin* should be given into the buttock. The initial dose of morphine, which is injected into an arm or leg, is 1 cc. of *morphine sulfate.* If, at the conclusion of the introduction of the intravenous injection of 1,000 cc. of normal saline solution, the patient is still suffering acute pain, an additional 1 cc. of morphine may be given.

In your casualty kit you have a bottle of *Tincture Metaphen.* It should be used to print on the forehead, or some other suitable area of the patient, the amount of morphine he has received, using the symbol "M.S.," denoting *morphine sulfate,* and Roman numerals to indicate the dose. Thus, if you have given 1 cc., write M.S.I. If you give 2 cc., change the I to II. This is to preclude the possibility of another member of the casualty squad giving additional injections of morphine.

As you will remember from Lecture I, the burns which are contemplated as a result of atomic explosion will probably be large and widespread. In addition, you will recall that we have based our entire treatment philosophy upon the attempt to keep the injured alive for 3 days. *Disposable diapers* are available to be used primarily and principally as protective covering for the burned area after application of *Biodyne ointment* with a wooden spatula. Unquestionably Vaseline, or any other nontoxic emollient, would work as well as Biodyne, but we have found over the past 6 years that Biodyne provides an excellent dressing for the treatment of burns.

There will be available tags which must be attached to all injured individuals. These tags contain, among other things, space for recording of the amount of normal saline and the time it was given, the amount of morphine and the time it was given, the extent of the area burned, and the initials of the individual performing the above functions. I cannot impress upon you too much the importance of fulfilling this procedure.

(To be continued in the December JOURNAL*)*

Department of Public Affairs

DONALD M. DONISTHORPE, D.O.
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1953 PUBLIC HEALTH LAWS

The September JOURNAL, pages 16 to 21, contained a comprehensive review of most of the public health laws enacted by the various legislatures at their 1953 sessions. In some instances copies of state laws had not been received at the time of the preparation of that report; this report, therefore, supplements the prior review by reporting under the same sectional arrangement as in the September article public health laws received since that time. Not all sections of the prior report are listed hereunder because of the absence of further laws to report.

1. LICENSING LAWS

Osteopathic Practice Acts.—

Ohio H.B. 781 amended the Medical Practice Act by making further provision for the licensure of physicians from foreign countries by permitting the state medical board in its discretion to license such physicians who did not have full practice rights abroad "upon completion of a course of training approved by the Board consisting of not less than twelve months of residency or internship in a hospital in the United States." Pennsylvania H.B. 1137 amended the Osteopathic Practice Act by requiring that graduates of an osteopathic college after July 1, 1954, shall present evidence to the Board of Osteopathic Examiners

> . . . that the applicant has completed not less than one year as an intern in a hospital approved by the Board which shall contain at least twenty-five beds devoted to the treatment of diseases, shall have at least ten beds per intern, shall maintain a properly equipped department of roentgenology under the direction of a qualified roentgenologist, shall maintain a thoroughly equipped laboratory proportionate to the necessities of the hospital, shall maintain a department of anesthesia consisting of one or more anesthetists, shall have a staff of not less than five properly qualified osteopathic physicians, including at least two osteopathic surgeons, except in hospitals operated by the federal government, any other state government, any political subdivision in any other such state or out of state voluntary nonprofit hospital wherein osteopathic physicians are permitted to practice together with other physicians.

The Pennsylvania law thus now requires for such future graduates completion of an internship as a prerequisite to applying for a license to practice osteopathy. Interns in osteopathic hospitals in the state approved by the Board of Osteopathic Examiners are exempt from the licensing requirements during the period of the internship. In addition the Board is authorized to issue a temporary certificate to practice osteopathy to doctors licensed in other states or provinces of Canada while they are enrolled in an approved residency training program in an osteopathic hospital which certificate shall be valid during the actual period of residency training. The section of the Osteopathic Practice Act providing for the issuance by the Osteopathic Surgeons' Examining Board of a license to practice major operative surgery was also amended by H.B. 1137 so as to require of graduates of osteopathic colleges after July 1, 1954, only an internship "for a period of not less than one year" where applicants graduating before that date are required to have "served for a period of not less than two years as an interne." This provision is a recognition of the one year internship requirement now made a professional requirement for the license to practice osteopathy issued by the Board of Osteopathic Examiners. Applicants for the license issued by the Osteopathic Surgeons' Examining Board graduating from an osteopathic college after July 1, 1954, are thus also required to have completed two years of internship, but the first year will now be approved by the Board of Osteopathic Examiners and the second year of internship by the Osteopathic Surgeons' Examining Board. No change was made in the further requirement of another third year of surgical training or special courses or training equivalent thereto as determined by the Osteopathic Surgeons' Examining Board. Wisconsin S.B. 160 amended the Medical Practice Act. The section pertaining to applications for licensure and the standards of professional education was amended by adding a provision regarding the procedure for the approval of a professional school or college qualifying its graduates to be eligible for a license to practice medicine and surgery, as follows:

> Before approving and recognizing any such college or school, the board shall conduct an investigation and during the course thereof shall hold a public hearing, with notice to all interested parties, at which any person may be heard. The board may designate an agent, including one or more board members, to conduct a portion or all of such investigation to determine the facts upon which the board shall make its findings. The findings and any action taken by the board with reference to approval or recognition of a school or college may be reviewed in the manner provided in chapter 227.

An amendment was added to the section of the law relating to the issuance of licenses by reciprocity requiring a similar investigation by the board to determine whether the requirements for licensure in the state in which the applicant for reciprocity is licensed are equivalent. The section of the same law listing the various examination subjects was amended by deleting the names of particular examination subjects and substituting a requirement that ". . . the applicant shall be examined in medicine and surgery, and further examined in the subjects taught in reputable professional colleges." A new provision further defining "immoral or unprofessional conduct" to include the "engaging in conduct unbecoming a person licensed to practice medicine or detrimental to the best interests of the public" was also added to the law. Another amendment to the section pertaining to revocation permits a license holder to voluntarily surrender his license and directs that the license "shall be reissued by the board only when justice demands such reissuance." Wisconsin S.B. 162 amended effective January 1, 1954, the section of the Wisconsin Medical Practice Act providing for the appointment of the members of the State Board of Medical Examiners. A provision that of board members "three members shall be allopathic, 2 homeopathic, 2 eclectic and one osteopathic" was deleted and replaced by a new requirement that ". . . 7 . . . shall be resident doctors of medicine and one . . . shall be a licensed resident doctor of osteopathy." The per diem of board members engaged in official duties was increased from $10.00 to $15.00 and it was provided that the secretary shall receive such compensation as the board determines, but not less than $1,800 annually. Wisconsin S.B. 162 also amended the section of the Medical Practice Act providing for a state medical grievance committee to investigate, hear, and act upon violations of the act by persons licensed thereunder by substituting the president of the state board of medical examiners upon the committee in place of the board's secretary. The other members of the grievance committee are the state health officer and the attorney-general or deputy attorney-general. Another amendment is the addition of a sentence authorizing all divisions, officials, and employees of state and local governments to cooperate with the grievance committee in conducting investigations and by making available to it pertinent data in their possession.

Other Practice Acts.—

New Jersey A.B. 380 enacted into law the "Bio-analytical Laboratory and Laboratory Directors Act" to be administered by the State Board of Medical Examiners to which the new law added a new member who shall be a licensed bio-analytical laboratory director. Both the director of a bio-analytical laboratory and the laboratory itself are required to be licensed.

The Governor is directed to appoint an advisory committee to consist of four licensed bio-analytical laboratory directors to assist the board of medical examiners in the administration of the law. A "Bio-analytical Laboratory" is defined as:

> . . . any place, establishment or institution organized and operated primarily for the performance of chemical, microscopic, serological, parasitological, bacteriological or any other tests, by the practical application of one or more of the fundamental sciences, to material originating from the human body, for the purpose of obtaining scientific data which may be used as an aid to ascertain the state of health. The interpretation of cytologic and histologic criteria of disease is not considered to be within the scope of this definition of a bio-analytical laboratory.

The act is comprehensive in character and provision is made for the qualification under the law of laboratories in existence before the passage of the law. The exemption section of the act states that it shall not affect "physicians or members of other professions who, in their private practices perform bio-analytical laboratory tests in their offices or laboratories for their own patients pursuant to licenses respectively granted to them according to law." Wisconsin A.B. 238 repealed the existing law pertaining to "massage" and created in its place a new law regulating the "Practice of Physical Therapy." The law will be administered by the board of medical examiners with the assistance of a state examining committee composed of three licensed physical therapists. Certificates issued heretofore to practice "massage and hydrotherapy" are continued in existence. A physical therapist licensed under A.B. 238 must practice ". . . under a prescription and the direct supervision of a person licensed to practice medicine and surgery."

2. BASIC SCIENCE LAWS

Wisconsin S.B. 161 amended the Wisconsin Basic Science Law. The basic science subjects were redefined to include "anatomy, physiology, pathology and physical diagnosis." The section pertaining to examination was amended by the addition of the following new authority:

> In lieu of its own examination, the board may accept, either in whole or in part, the certificate of the national board of medical examiners provided that certification by the national board is accepted by the state board of medical examiners in whole or in part and that such certification is accepted by the basic science boards of at least 6 other states.

Waiver of the basic science examination was formerly limited to persons who presented evidence of having passed examinations in the basic sciences before a legal examining board or officer of another state. A provision of the Wisconsin Basic Science Law which provided that "If the applicant states that his practice is to be confined to one organ or set of organs, his examination and certificate shall be limited accordingly" was deleted from the law by S.B. 161.

3. STATE HEALTH AND WELFARE PLANS

Alabama S.B. 155 created a medical scholarship program of six scholarships annually for qualified students to attend the University of Alabama Medical College. Each scholarship shall amount to not more than $1,250 in any 1 year nor more than $5,000 in entirety. Each recipient must agree to enter into an agreement with the State Board of Health whereby he agrees to practice medicine for 5 years after the completion of his medical training in a rural area or locality of the state, and failure to so do makes the recipients liable to pay back the monetary value of the scholarships and constitutes a ground for the revocation of their licenses to practice medicine.

4. SUPPLEMENTARY PUBLIC HEALTH LAWS

Alabama H.B. 800 requires that all actions against physicians, surgeons, and dentists for malpractice, error, mistake, or failure to cure, whether based on contract or tort, must be commenced within 2 years next after the act or omission or failure giving rise to the cause of action, and not afterwards. It is provided, however, that if the cause of action is not discovered and could not reasonably have been discovered within such period, then the action may be commenced within 6 months from the date of such discovery or the date of discovery of facts which would reasonably lead to such discovery, whichever is earlier, provided further that in no event may the action be commenced more than 6 years after such act. New Jersey S.B. 228 amended the medical service corporation act to make the services of chiropodists available to subscribers under medical service plans. Pennsylvania H.B. 1536 enacts a law creating a Division of Alcoholic Studies and Rehabilitation in the Department of Health and directs the Division to contract for and establish such hospital and clinical facilities as are necessary to care properly for persons addicted to the excessive use of alcoholic beverages. Persons so addicted may be committed for care either upon voluntary application or through court commitment. The procedures and regulations pertaining to such commitments are made similar to those long in effect relating to commitment for mental illness. Wisconsin S.B. 133 amended the law pertaining to the qualifications of physicians to testify as expert witnesses on medical subjects and reaffirmed the right of doctors of osteopathy to so testify.

Department of Public Relations

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BILLS IN CONGRESS

The first session of the 83rd Congress convened on January 3, 1953, and adjourned August 3, 1953. All proposed legislation not enacted during the first session retains its status for consideration during the second session, which convenes January 6, 1954. The following are Bills introduced or acted on subsequent to the press date of Bills in Congress in the August, 1953, JOURNAL:

H.R. 5016—Amends Food and Drug Act to identify aureomycin by its chemical name, chlortetracycline. Public Law 201, approved August 5, 1953.

H.R. 5246—1954 appropriation for Departments of Labor, and Health, Education and Welfare. Re-enacts limitation against discrimination by Children's Bureau in connection with obstetric programs. Public Law 170, approved July 31, 1953.

H.R. 5561—Provides that certain drugs, chemically synthesized, shall be narcotic drugs under the Internal Revenue Code and the Narcotic Drugs Import and Export Act. Public Law 240, approved August 8, 1953.

H.R. 5740—Amends Federal Food, Drug, and Cosmetic Act to provide certain authority for factory inspection. Public Law 217, approved August 7, 1953.

H.R. 6384—Mr. Short, of Missouri. To enforce service agreement of officers' training corps trainees.

H.R. 6412—Mr. Frelinghuysen, of New Jersey. Preserves eligibility of certain veterans to dental outpatient care and dental appliances. Passed House, July 30, 1953.

H.R. 6430—Mr. Heller, of New York. To assist in providing old-age security.

H.R. 6434—Mr. Hale, of Maine. Amends Federal Food, Drug and Cosmetic Act to simplify establishment of food standards. Passed House, July 30, 1953.

H.R. 6481—Refugee Relief Act of 1953. Among other provisions, provides that priority in the consideration of visa applications shall be given to "persons whose services or skills are needed in the United States, if such need has been certified through the Administrator, at his request, by the United States Employment Service, and who are to be employed in a capacity calling for such services or such skills." Public Law 203, approved August 7, 1953.

H.R. 6485—Mrs. Rogers, of Massachusetts. Outpatient

dental care for veterans with dental claims adjudicated prior to July 1, 1953. Reported to House, July 24, 1953.

H.R. 6508—Mr. Holtzman, of New York. Changes OASI Social Security Act retirement age from 65 to 60.

H.R. 6573—Mr. Johnson, of California. Reserve Officer Personnel Act of 1953. Passed House, July 31, 1953.

H.R. 6583—Mr. Hagen, of Minnesota. Establishes a Federal Recreation Service in the Department of Health, Education and Welfare, and provides for consultant services to hospitals.

H.R. 6657—Mr. Wainwright, of New York. Amends Vocational Rehabilitation Act to increase economic opportunities of blind persons.

H.R. 6661—Mr. Edmondson, of Oklahoma. To promote education and rehabilitation of Indians of U. S. Provides that 10% of money derived by Federal Government from natural resources of the Continental Shelf be earmarked as "Indian Education and Rehabilitation Fund."

H.R. 6664—Mr. Heller, of New York. Social Security Act Amendments of 1953. Continues OASI exemption of doctors.

H.R. 6702—Mr. Miller, of Nebraska. Authorizes Public Health Service care for narcotic addicts committed by the District Court for the District of Columbia. Passed House, August 1, 1953.

H.R. 6709—Mr. Ford, of Michigan. Officer Training Corps Act of 1953.

H.R. 6723—Mr. Price, of Illinois. Same as H.R. 6664.

H.R. 6724—Mr. Short, of Missouri. Regular Army Integration Act of 1953.

H.R. 6812—Mr. Reed, of New York (by request). Old-Age and Survivors Insurance Amendments of 1953. Removes exemption of doctors from OASI coverage, as self-employed.

H.R. 6846—Mr. Kean, of New Jersey. Same as H.R. 6812.

S. 967—Extends Hill-Burton Act to June 30, 1957 (was due to expire July 1, 1955). Public Law 151, approved July 27, 1953.

S. 977—Amends National Science Foundation Act to remove $15 millions ceiling on annual appropriations. Public Law 223, approved August 8, 1953.

S. 1515—Permits compact by certain Western states relating to higher education. Public Law 226, approved August 8, 1953.

S. 1901—(H.R. 5134). Relates to jurisdiction over submerged lands of outer Continental Shelf. Oil-for-education amendment deleted after substitution of H.R. 5134. Public Law 212, approved August 7, 1953.

S. 2436—Mr. Potter, of Michigan. Amends Vocational Rehabilitation Act to authorize separate State plans for blind persons.

S. 2437—Mr. Potter, of Michigan. Amends Vocational Rehabilitation Act to establish rehabilitation centers.

S. 2466—Mr. Hunt, of Wyoming. Preserves eligibility of certain veterans to dental outpatient care and dental appliances.

S. 2545—Mr. Humphrey, of Minnesota (for himself, Mr. Douglas, of Illinois, and Mr. Kennedy, of Massachusetts). Amends Immigation and Nationality Act. Liberalizes allotment of immigrant visas to qualified quota immigrants whose services are determined by the Attorney General to be needed urgently in the United States, because of the high education, technical training, specialized experience, or exceptional ability of such immigrants and to be substantially beneficial prospectively to the national economy, cultural interests, or welfare of the United States.

S. 2569—Mr. Hendrickson, of New Jersey (for himself and Mr. Case, of South Dakota). Amends Section IX of the Outer Continental Shelf Lands Act, to include oil-for-education provision.

S. 2570—Mr. Murray, of Montana, and others. Abolishes Office of Vocational Rehabilitation and assigns functions to an independent agency to be known as Federal Agency for Handicapped.

S. 2591—Mr. Aiken, of Vermont (by request). Establishes in the Department of Health, Education and Welfare a Federal Recreation Service, with consultant to hospitals.

COMMISSION ON ORGANIZATION

Created by the Brown-Ferguson Act of July 10, 1953 (Public Law 108), the so-called second Hoover Commission on Organization of the Executive Branch of the Government on September 29 chose former President Hoover as chairman, former Republican Congressman John B. Hollister, of Cincinnati, as executive director, and Francis P. Brassor, chief of the Civil Service Commission's Administrative Services, its executive secretary. A similar Commission also headed by Mr. Hoover made its final report in 1949, and many of its recommendations are in effect. The new twelve-man Commission will not only seek efficiency, it will determine whether an agency is necessary or too much in competition with private enterprise. A final report is due by May 31, 1955, and interim reports are required. The new Commission, like the old, will enlist expert research groups called "Task Forces." Nine "Task Forces" will make studies in specific government fields, including government medical services. Commission members are as follows:

*Representative Clarence J. Brown (R.-Ohio)

Honorable Herbert Brownell, Jr., Attorney General of the United States

Honorable James A. Farley, former Postmaster General

Senator Homer Ferguson (R.-Mich.)

*Arthur S. Fleming, Director, Office of Defense Mobilization

Representative Chet Holifield (D.-Calif.)

Solomon C. Hollister, Dean, Cornell University School of Civil Engineering

*Honorable Herbert Hoover, former President of the United States

*Honorable Joseph P. Kennedy, former Ambassador to Great Britain

*Senator John L. McClellan (D.-Ark.)

Sidney A. Mitchell, executive director of the First Hoover Commission

Robert G. Storey, dean, Southern Methodist University School of Law

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COMMISSION ON INTERGOVERNMENTAL RELATIONS

A new twenty-five-man Commission on Intergovernmental Relations was created by the Taft-Halleck Act, approved July 10, 1953 (Public Law 109). It will study overlapping of federal-state functions and expenditures, such as federal aid to states and communities, including medical grants-in-aid. There are more than thirty grant-in-aid programs, involving expenditures of over $2 billions a year. The Commission's final report is due not later than March 1, 1954. The Commission members are:

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FIBROCYSTIC DISEASE OF THE PANCREAS—TEPLITZ

(Continued from page 158)

the brother. Intensive therapy was begun along the line suggested by Andersen[16] (large doses of pancreatin, high protein-low fat diet, and administration of fat-soluble vitamins) with the addition of Prostigmin, bromide,[12] and antibiotics. Unfortunately the improvement in the patient's condition was not of long enough duration to permit vitamin A tolerance studies. He expired rather suddenly of respiratory failure after bouts of paroxysmal coughing and cyanosis. Autopsy revealed findings almost identical (Figs. 3 and 4) with those obtained in the brother.

The fact that both patients died of asphyxia rather than inanition or ileus and that their predominant symptoms and findings were in the lungs, emphasizes the supposition of Farber[6] that this disease is a generalized one. Trypsin activity was detected in one of the twins, and as far as ascertained no great excess of fat was found in the stool, grossly or chemically. Likewise no metaplasia could be isolated. These findings suggest that enough enzyme was passing into the intestine to render the tests negative, but not sufficient to prevent fatal changes. They demonstrate the fact that the approach to this disease must remain physiologic rather than classical. It also illustrates an important presenting complaint referable to the lungs, commonly missed by the physician who expects meconium ileus or steatorrhea as the dominant initial picture.

It is to be hoped that some aid to making an early diagnosis has been rendered by reporting the cases. Certainly with the promising results obtained by Andersen[16] a chance for extension of life with possible cure may be given the patient.

SUMMARY

The importance of early diagnosis and aids to early diagnosis of fibrocystic disease of the pancreas are discussed. Theories regarding etiology and pathogenesis and the possibility of a hereditary nature of the condition are mentioned. Laboratory findings in this entity are reviewed. Fibrocystic disease of the pancreas occurring in identical twins is described, and the importance of a presenting complaint referable to the lungs is pointed out.

Acknowledgments

Acknowledgment is made to R. P. Morhardt, D.O., and W. Harriett Davis, D.O., for assistance with the pathologic material; to Joe Farber, D.O., Jerome Drell, D.O., and Mr. Robert Ingalls for help with the protomicrographs; and to Mrs. Juanita Wallace for the excellent tissue preparations.

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